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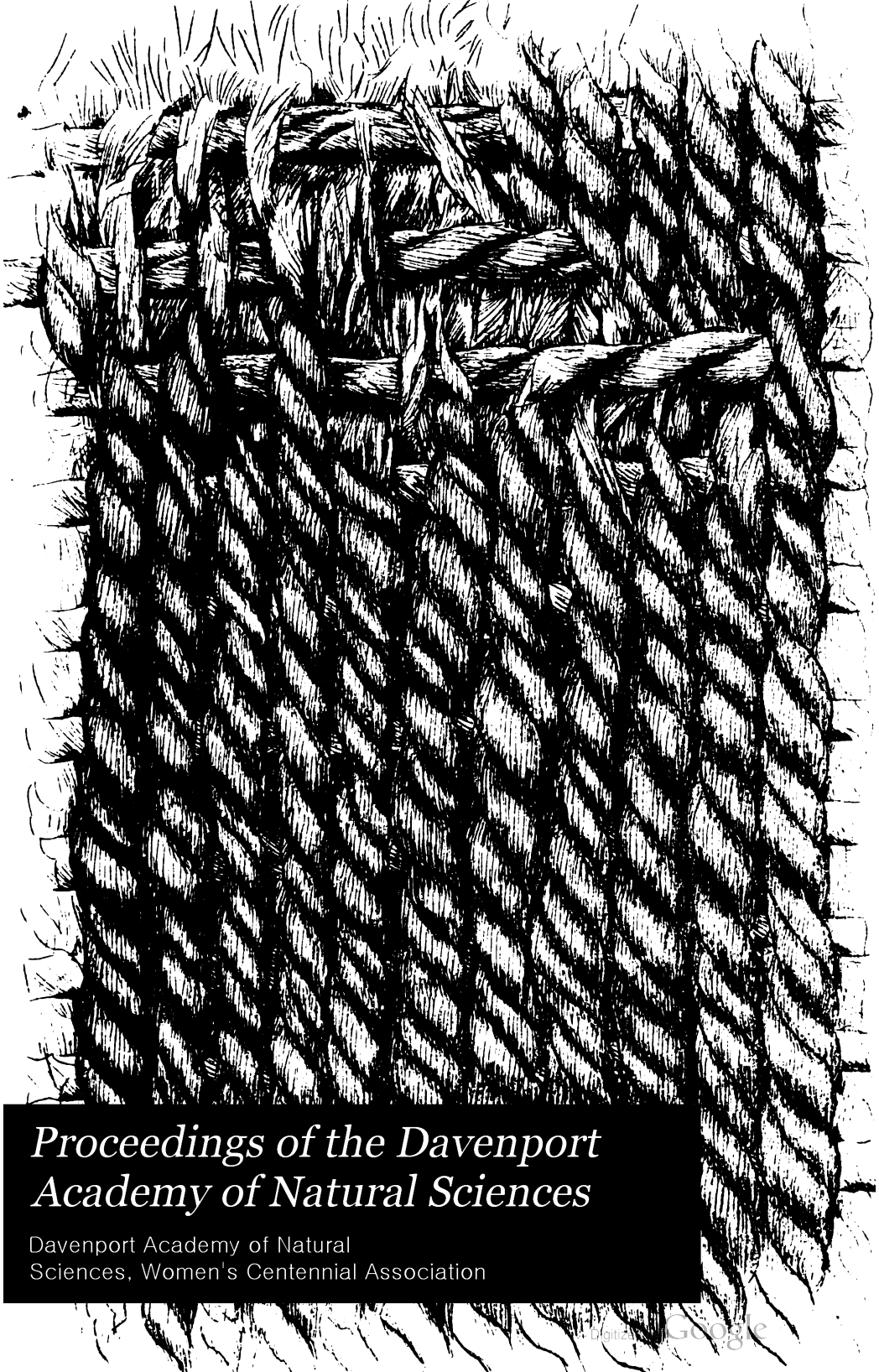
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*Proceedings of the Davenport
Academy of Natural Sciences*

Davenport Academy of Natural
Sciences, Women's Centennial Association

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Davenport, Iowa. 1876.*

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OF THE
(*Iowa*)
DAVENPORT ACADEMY
OF
NATURAL SCIENCES.

VOLUME I.
1867-1876.

DAVENPORT, IOWA:
PUBLISHED FOR THE ACADEMY
BY THE
WOMEN'S CENTENNIAL ASSOCIATION,
1876.

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The Academy.

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P R E F A C E.

N presenting to the public, the first volume of the PROCEEDINGS OF THE DAVENPORT ACADEMY OF NATURAL SCIENCES, a few words concerning its origin and history, and the circumstances under which it is issued, may not be out of place.

DAVENPORT is a thriving commercial and manufacturing city of about 25,000 inhabitants, situated on the west bank of the Mississippi River, in the heart of an extensive grain-growing region. The city being as yet scarcely forty years old, its population, like that of most western towns, is unsettled and constantly changing. Nearly all its inhabitants are engaged in active business, and but few have the leisure or inclination to cultivate the more unremunerative branches of knowledge. The city is however, so situated as to afford many advantages to the student of Nature. The underlying limestone abounds in fossils of the Hamilton and Upper Helderburg groups, the rivers and ponds produce a remarkably fine development of molluscan life, while the close proximity of the prairies to the wooded bottom lands, affords a rich field for the botanist and the entomologist. This region was once the residence of a prehistoric people, who have left many obscure traces behind them, furnishing an abundance of material for the archæologist to ponder over.

Here, on the 14th of December, 1867, a few of those who had been in the habit of devoting their leisure hours to the study of Nature, met together and organized the DAVENPORT ACADEMY OF NATURAL SCIENCES. Beginning with but four members, the number had increased to fifty-four at the end of 1868. During the winter of 1868-9 the meetings were well attended and considerable interest was manifested in the objects of the Academy. Several papers of general interest were read and discussions of scientific subjects

served to render the meetings entertaining and instructive. A cabinet was begun in the rooms of the Davenport Library Association. A telescope was purchased and the meteoric shower of Nov. 13th, 1868, was observed by a number of the members. The next year was mainly occupied in making preparations for observing and photographing the total eclipse of the sun, Aug. 7th, 1869, and in subsequent discussion of the results. Eighteen members were added.

During the next three years but comparatively little interest was manifested in the affairs of the Academy, and the attendance at the meetings was very small. But eight members were added during this time. In July 1873, a small back room was rented, and the three or four cases containing the cabinet and library were moved in and arranged. For over five years the Academy had accepted the hospitality of the Library Association in furnishing a room for meetings and a portion of the cabinet, but now for the first time in its existence it possessed a home of its own. The attendance soon began to increase and the Academy slowly awoke from the deep lethargy into which it seemed to have fallen. During the summer and fall of this year, the attention of the members was largely directed to the exploration of pre historic mounds—and more particularly to those near Albany, Ill., where many interesting and valuable discoveries were made. The membership was increased by thirteen additions this year.

In April 1874, a more commodious and better lighted room was obtained in Odd Fellows' Building. Early in the year the Academy received a fresh impetus by the purchase of the fine geological library of Prof. Barris, which was accomplished mainly through the exertions of Mr. A. S. Tiffany. During the greater part of the year "Conversations" were held weekly at the Academy rooms. These were quite popular, and besides disseminating much useful information, added greatly to the interest taken in the Academy by the general public. Altogether this year was one of the most prosperous yet known. Fifteen members were added.

The past year, 1875, has been one of unprecedented prosperity for the Academy. Early in the year the very remarkable archæological treasures brought to light almost within the city limits, by Rev. J. Gass, awakened greater interest in the examination of the mounds so numerous all about the city, and the collection of mound-builders' relics grew so rapidly that it is now one of the best in the country and in some departments is unique. The collections of ancient stone and flint implements were also very extensive, made mainly through the efforts of Capt. W. P. Hall. Much interest was manifested in the work of the Academy by the lady members, and through their efforts the room was handsomely furnished and new cases obtained for the rapidly increasing collections. Indeed, the cabinet continued to increase so rapidly that it soon became necessary to obtain a second apartment. This too, was furnished by the ladies, and through the unremitting labors of the Curator, who has devoted every leisure moment to the work, the collections have all been carefully arranged and labeled. Towards the close of the year it was thought sufficient materials had been accumulated to warrant the Academy in commencing the publication of its Proceedings, and a committee was appointed to prepare the work. The "Women's Centennial Association" of Davenport, upon learning that this was proposed, kindly offered to undertake its publication—and the result is this volume. Eighty-five new members were elected during the year, of whom forty-three were ladies.

Having given a sketch of the history of the Academy, a few words about this, its first publication will be in place. It was thought best to publish the proceedings from the beginning, thus furnishing a complete history of the Academy. The difficult task of copying the records of proceedings was done gratuitously by Miss Lucy Pratt, in a most satisfactory manner. The longer papers and reports have been collected at the close of the proceedings and arranged as nearly as may be, according to subjects. In preparing

the papers for publication it has been the endeavor of the committee to give preference to those containing statements of facts, rather than speculations. The authors of the papers are alone responsible for what is contained in them. The lists of plants and animals have been prepared with much care by those most interested in each. They will be useful in studying the geographical distribution and also in making exchanges. In preparing the lists of Insects, much aid has been given by Entomologists distinguished in their respective specialties, thus giving a value to the work it would not otherwise possess. A Catalogue of the Library is inserted, so that in making exchanges or donations, our friends can see what books we are in need of, and act accordingly. In printing the catalogue the sub-headings were accidentally omitted, thus causing a somewhat confused appearance. An index has been prepared which will no doubt be found useful by those who have occasion to consult the volume. Thirty-two lithographic plates have been engraved by Mr. A. Hagebœck, for this volume—mainly illustrating some of the more interesting objects contained in the Archæological Cabinet of the Academy. A wood cut illustrating one of the cloth covered copper-axes, was engraved by J. E. Rice, and through the liberality of Mrs. E. Cook, on whose farm the axe was found, is reproduced in a gilt stamp on the cover. Besides these, two plates, illustrating objects contained in our collection, from the forthcoming volume of Proceedings of the Detroit Meeting of the American Association for the Advancement of Science, have, through the courtesy of Prof. F. W. Putnam, been received in exchange for two of our plates. Two plates have been engraved by Mr. Herman Strecker, to illustrate some of the new insects described. An electrotpe of the Plan of the Albany Mounds was loaned by the Smithsonian Institution. With these last few exceptions the work is most entirely a home production. Considering the difficulties of the undertaking, the printers deserve great credit for the manner in which they have done their part of the work.

It is the intention of the Academy, if possible, to issue an additional number of Proceedings as often as once a year.

The most grateful thanks of the Academy are due to the ladies of the Centennial Association for the difficult part they have taken in supplying the funds necessary for the completion of the work. During a series of entertainments given for this purpose, they encountered a disastrous fire, which occasioned losses to various persons to the amount of about \$1,000—and which, considering themselves at least morally bound, they have bravely liquidated in full, in addition to the cost of this publication.

Especial mention should also be made here of the active part taken by our enthusiastic young friend and associate, Mr. J. Duncan Putnam, who, though in feeble health, has, in addition to his previous arduous and successful labors in scientific research as shown in the pages of this volume, also performed a large portion of the labor in preparing and arranging the material for, and in revising, correcting, and general supervision of the work.

JULY 4TH, 1876.

OFFICERS FOR 1876.

President PROF. W. H. BARRIS, D. D.
Vice-President GEO. H. FRENCH.
Corresponding Secretary MRS. M. A. MCGONEGAL.
Recording Secretary C. H. PRESTON, M. D.
Treasurer ... JOHN HUME.
Librarian R. J. FARQUHARSON, M. D.
Curator W. H. PRATT.

Trustees:

PROF. D. S. SHELDON, WM. RIEPE, CHAS. E. PUTNAM,
and the above seven officers *ex. officio*.

Publication Committee:

W. H. PRATT, J. DUNCAN PUTNAM, C. H. PRESTON,
R. J. FARQUHARSON, GEO. H. FRENCH.

Museum Committee:

WM. H. PRATT, R. J. FARQUHARSON, J. G. HAUPT,
J. D. PUTNAM, A. S. TIFFANY, JOHN HUME.

Library Committee:

R. J. FARQUHARSON, C. H. PRESTON, MRS. S. R. MILLAR.

Finance Committee:

C. E. PUTNAM, JOHN HUME, G. H. FRENCH.

Committee on Furniture and Rooms.

JOHN HUME, MRS. C. E. PUTNAM, MRS. M. A. SANDERS.

PROCEEDINGS
OF THE
DAVENPORT ACADEMY
OF
NATURAL SCIENCES.

VOLUME I.

RECORD OF PROCEEDINGS.

DECEMBER 14TH, 1867.

At a meeting held this evening, in the office of Mr. L. T. Eads, for the purpose of organizing a NATURAL HISTORY SOCIETY, Messrs. L. T. Eads, A. U. Barler, A. S. Tiffany, and W. H. Pratt were present.

Mr. A. U. Barler was called to the chair.

A copy of the Constitution of the "Ottawa Academy of Natural Sciences" was read, and, on motion, was adopted, with blanks for the name of the Society, date of annual meeting, and name of Trustees.

The following officers were elected to serve for six months, or until their successors were qualified:

Prof. D. S. SHELDON,	<i>President.</i>
A. U. BARLER,	<i>Vice-President.</i>
W. H. PRATT,	<i>Secretary.</i>

And the following Board of ten Trustees to serve for life:

W. H. PRATT,	A. U. BARLER,	L. T. EADS,
A. S. TIFFANY,	WM. RIEPE,	D. S. SHELDON,
D. S. TRUE,	C. C. PARRY,	C. S. ELLS,
	W. H. BARRIS.	

On motion, it was voted that the following persons be made honorary members of the Society, viz:

Enoch May, Burlington, Iowa; V. R. Faught, Hamilton, Illinois; C. V. Riley, Chicago, Illinois; W. Crapnell, New Boston, Illinois; S. H. Dickey, Fulton, Illinois; Dr. Roe, Bloomington, Illinois; Thos. T. Jones, Coal Valley, Illinois; Gen. T. J. Rodman, and Benj. D. Walsh, Rock Island, Illinois; D. Lathrop, LaSalle, Illinois; Dr. F. Higday, LaPorte, Indiana; Prof. A. H. Worthers, Springfield, Illinois; Prof. C. A. White, Iowa City.

On motion, the Society adjourned to meet on Saturday evening, December 21st.

DECEMBER 21ST.—ADJOURNED MEETING.

Vice-President BARLER in the chair.

Members present: L. T. Eads, A. U. Barler, A. S. Tiffany, W. H. Pratt, and W. Riepe.

On motion, the Secretary was directed to fill the blank for name of Society, as follows: "DAVENPORT ACADEMY OF NATURAL SCIENCES." Also, the blank for date of annual meeting, as follows: "First Saturday in June."

Mr. Eads proposed to amend the Constitution by striking out Article V, and amending Article IV to read as follows:

ARTICLE IV. Honorary and corresponding members shall have all the privileges of the Academy except the right of voting and holding office, and in case of becoming citizens of Scott county, Iowa, may become members by payment of the initiation fee.

Also, to re-number the remaining Articles of the Constitution.

On motion, the By-Laws of the Ottawa Academy were adopted in blank, and the Secretary was directed to fill the blanks to correspond with the Constitution.

CONSTITUTION AND BY-LAWS.

ADOPTED DECEMBER 21ST, 1867.

Constitution.**NAME OF THE SOCIETY.**

ARTICLE I. This Society shall be called the Davenport Academy of Natural Sciences.

OBJECT OF THE SOCIETY.

ART. II. The object of this Society shall be the increase and diffusion of a knowledge of the Natural Sciences, by a Museum, the reading and publication of original papers, and other suitable means.

MEMBERSHIP.

ART. III. The Academy shall consist of regular members, corresponding members, and honorary members.

ART. IV. Honorary members shall have all the privileges of the Academy, except the right of voting and holding office.

ART. V. Corresponding members shall have all the privileges of the Academy, except the right of voting and holding office, and in case of becoming citizens of Scott county, may become regular members by the payment of initiation fee. Candidates for admission into the Academy (whether as regular, or corresponding, or honorary members) must be proposed in writing, by two members, at a business meeting, and be balloted for at the next meeting, any candidate receiving three negative ballots being rejected. A rejected candidate shall not be eligible for membership for three months.

ART. VI. Any member may be expelled for cause, or be removed from office after due hearing, by a two-thirds vote of the members present, at any regular meeting.

OFFICERS.

ART. VII. The officers of the Academy shall be a President, Vice President, and Secretary, who shall be elected at the annual meeting, on the first Tuesday in March, and shall hold their offices for one year, or until their successors are elected and qualified.

ART. VIII. All the above named officers shall be chosen by ballot.

ART. IX. Vacancies occurring from any cause in any of the regular offices of the Academy, shall be filled by ballot at any regular meeting; notice of such election being given by the Secretary in one of the Davenport papers.

ART. X. No member shall be allowed to vote unless he shall have paid all of his dues, and attended two regular meetings of the

Academy within the previous year, unless prevented by sickness or absence from the city.

BOARD OF TRUSTEES.

ART. XI. All the money, property and effects of this Academy of Sciences, shall be held and managed by the Trustees, and the title thereto, as also the title to all the real estate owned by said Academy of Sciences, shall be vested in the Trustees.

ART. XII. Each Trustee shall hold his office for life, unless he shall remove from the City of Davenport, Iowa, in which event his term of office shall expire, or unless he shall be removed as herein-after stated.

ART. XIII. The first Board of Trustees shall consist of the following named persons: W. H. Pratt, A. U. Barler, L. T. Eads, A. S. Tiffany, Wm. Riepe, D. S. Sheldon, D. S. True, C. C. Parry, C. S. Ellis, and Rev. W. H. Barris.

ART. XIV. Said Board shall at once organize by appointment of a temporary Chairman, and a Secretary, after which said Board shall perfect its own plan of permanent organization, and elect its own officers. Any plan may be changed or altered by said Board of Trustees, from time to time, as it shall see fit.

ART. XV. Vacancies in the Board shall be filled by ballot, by election of the Academy; a majority of the members of the Academy, present and voting, at the next regular meeting after a vacancy occurs being necessary and sufficient for the election of a Trustee or Trustees to fill such vacancy.

ART. XVI. Any Trustee may be removed with the concurrence of a majority of the Trustees, if two-thirds of the members of the Academy present at any regular meeting—the “yeas” and “nays” being called—shall so vote and determine.

ART. XVII. Said Board of Trustees shall have full and exclusive power and authority to manage and control and employ the money, finances and property of said Academy of Natural Sciences of Davenport. But the regular officers of said Academy may at all times make such rules and regulations as by them shall be deemed proper, relative to the use of the museum and scientific property and effects of said Academy, with no authority to remove the same, or any part thereof, out of the rooms provided by said Board of Trustees.

ART. XVIII. The Board of Trustees shall determine upon its own plan of organization, and all its official acts, evidenced in the manner by it designated, shall bind the Academy.

ART. XIX. No provision of this Constitution relative to the Board of Trustees shall be changed or altered, anything in the Constitution

contained to the contrary notwithstanding, without the consent of said Board of Trustees.

ART. XX. All initiation fees, annual assessments and dues shall be paid to the Treasurer of the Board of Trustees as they become due, without notice, and any member who shall fail or neglect to pay his initiation fees, or any annual assessment, or dues for the space of one year, after the same is due, shall, if a majority of the members present at any regular meeting so determine, forfeit his membership, and all right and interests in said "Davenport Academy of Natural Sciences," and its property and Museum, and the records in the minutes of said Academy of such default and vote shall be *prima facie* evidence that the membership of the person named in such record is determined and ended.

ART. XXI. The three Directors of the Museum shall be appointed by the Board of Trustees, and shall be continued in office until removed by said Board. Their duties shall be determined by the Board.

ART. XXII. No compensation shall be paid to any person whatever, and no expenses incurred for any reason whatever, *except* under the authority of the Board of Trustees.

ALTERATION OF THE CONSTITUTION.

ART. XXIII. Every proposition to alter or amend the Constitution shall be submitted in writing at a regular meeting, and if two-thirds of the members present at the next regular meeting, vote in the affirmative, it shall be adopted.

BY - LAWS.

MEETINGS.

ART. I. The regular meeting of this Academy shall be held on the first Saturday in every month. The hour to be designated by the Secretary in the notice of the meeting.

DUTIES OF OFFICERS.

ART. II. The President shall preside at all meetings of the Academy, and call such special meetings as he shall deem necessary, or as he may be requested to call by any five members.

ART. III. The Vice President shall perform the duties of the President in case of his absence or inability to act.

ART. IV. The Secretary shall keep a record of the proceedings of the Academy, shall notify all members of their election, and all committees of their appointment, shall keep a correct list of the member, of the society with the date of their election, resignation or deaths shall have charge of the seal of the Academy, and shall notify all

members residing in Davenport of the meetings. He shall also have charge of the correspondence not otherwise provided for, and shall make a report of all communications received or written by him for the Society, at each meeting.

ART. V. The Directors of the Museum shall have charge of the Museum and Books.

MUSEUM AND LIBRARY.

ART. VI. No books shall be taken from the Library, or specimens from the museum, except by the order of the Board of Trustees.

FINANCES.

ART. VII. Every member elected shall pay an initiation fee of Five Dollars; also an assessment of One Dollar, at each annual meeting.

WITHDRAWAL OF MEMBERS.

ART. VIII. Any member may withdraw from the Academy, provided he has paid all arrearages due to the Academy.

ORDER OF BUSINESS.

ART. IX. The order of business meetings shall be as follows:

1. Calling roll of members.
2. Reading minutes of previous meeting.
3. Reception of donations.
4. Reports of committees.
5. Correspondence.
6. Deferred business.
7. New business.
8. Reading and discussion of scientific papers.

ART. X. Any member who shall be in arrears for initiation fees or dues for one year, shall, after ten days notice by the Treasurer of the Board of Trustees, cease to be a member of the Academy, unless such fees and dues are paid within the ten days.

ALTERATION OF BY-LAWS.

ART. XI. The By-Laws may be altered or amended in the same manner as is provided in the Constitution, for its alteration or amendment.

DECEMBER 28TH, 1867.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Five members present.

The proposition to amend the Constitution made at the last meeting was adopted.

JANUARY 4TH, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Four members present.

Mr. Edward Seve, New York, and Mrs. M. A. Sanders, Davenport, were elected honorary members.

Frank B. Tanner, Dubuque, Iowa; Edwin Ayres, A. D. Eads, and Miss Mary O. Ayers, Champaign, Illinois; W. D. Somers, and Dr. Blackshaw, Urbana, Illinois; W. B. Moore, San Antonio, Texas; Joshua Dial, Senatobia, Mississippi; Joshua J. Miles, Clinton, Illinois; Rev. Samuel Eads, Bolton, Mass.; W. O. Hiskey, Minneapolis, Minn.; Theodore Nissen, Rock Island, were elected corresponding members, and Mr. John Hume, Davenport, a regular member.

At a meeting of the Trustees, held this evening, Messrs. Sheldon, Barler, and Pratt were chosen Directors of the Museum, and Mr. L. T. Eads Treasurer of the Board of Trustees.

JANUARY 18TH, 1868.—SPECIAL MEETING.

Vice-President Barler in the chair.

Five members present.

A large number of donations to the Museum and Library were reported.

Several letters were read from honorary and corresponding members, acknowledging their election.

Mr. J. L. Bean was elected a regular member.

At a meeting of the Trustees, this evening, Messrs. Eads, Tiffany, and Pratt were appointed a Committee of Finance.

JANUARY 25TH, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Five members present.

Dr. T. J. Iles, Thos. Dermody, and John L. Davies were elected resident members.

H. S. Bliss, Galena, Illinois; W. E. Wellington, Dubuque, Iowa; Thos. Lighton, David Lingle, and Milo Lee, Rock Island, Illinois; and J. R. Stewart, Toledo, Iowa, were elected corresponding members.

Prof. G. Hinrichs, Iowa City, Iowa; and M. S. Hall, Wilmington, Illinois, were elected honorary members.

FEBRUARY 1ST, 1868.—REGULAR MEETING.

Vice-President Barler in the chair.

Four members present.

Dr. R. D. Myers, H. Wheeler, and C. G. Plummer were elected regular members.

Dr. I. A. Lapham, Milwaukee, Wisconsin, and Dr. Robert Kennicott, Chicago, Illinois, were elected honorary members.

It was voted to amend Article XII of the Constitution, by striking out the word *City*, and inserting instead thereof the word *Township*.

ARTICLES OF INCORPORATION.

[FILED FEBRUARY 14TH, 1868.]

WE, the undersigned, A. U. Barler, Luther T. Eads, and W. H. Pratt, do hereby certify that we have formed an association to be known by the name or title of the "Davenport Academy of Natural Sciences," for the purpose of "the increase and diffusion of knowledge in the Natural Sciences, by a museum, the reading and publication of original papers, and other suitable means," and that the property of said association is to be held by ten trustees, who are elected for life, or during their residence in Davenport township. The first board of trustees are D. S. Sheldon, C. C. Parry, Willis H. Barris, William Riepe, David S. True, C. Stewart Ellis, A. S. Tiffany, A. U. Barler, W. H. Pratt, and Luther T. Eads.

IN TESTIMONY whereof we have hereunto set our hands and seals this 13th day of February, A. D. 1868.

A. U. BARLER,	[SEAL.]
LUTHER T. EADS.	[SEAL.]
W. H. PRATT.	[SEAL.]

STATE OF IOWA, }
County of Scott. } ss.

Subscribed and acknowledged before me this 13th day of February, A. D., 1868.

CHARLES H. KENT, Notary Public.

FEBRUARY 8TH, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Six members present.

Messrs. W. P. Campbell, Miles A. Collins, E. A. Day, and W. H. Holmes were elected regular members.

On the evening of February 15th, Prof. G. Hinrichs delivered a lecture before the Academy, in the German Theater. Subject: "Pantogen, or the Element of Elements."

FEBRUARY 22D, 1868.—DEFERRED MEETING.

Vice-President Barler in the chair.

Six members present.

W. J. Stephenson was elected a regular member, and Isaac Cummings, and Rev. Henry Baylies were elected corresponding members.

The thanks of the Academy were voted to Lieut. Griffith for his donation of Reindeer Moss from Canada.

FEBRUARY 29TH, 1868.—ADJOURNED MEETING.

Vice President Barler in the Chair.

Five members present.

C. S. Watkins, Jas. Renwick, W. D. Vermillion, Ira M. Gifford, Otto Schmidt, and M. Donahue, were elected regular members.

MARCH 7TH, 1868.—REGULAR MEETING.

Vice-President Barler in the chair.

Six members present.

A letter of acceptance of corresponding membership from Mr. Wm. Crapnell, of New Boston, Illinois, was read. Also, a letter from Mr. Levi Burnell, of Milwaukee, with one enclosed from Prof. Henry to him, relating to the explosion of carburetted hydrogen gas, by percussion caps.

MARCH 14TH, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Four members present.

Messrs. William Renwick and James Thompson were elected regular members.

Nathan H. Parker, St. Louis, and Levi Burnell, Milwaukee, were elected corresponding members.

MARCH 21ST, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Six members present.

The Secretary read a letter from Mr. Joshua Dial, of Senatobia, Miss., accepting corresponding membership.

Dr. D. C. Roundy, and George S. C. Dow, were elected regular members, and Prof. Powell, Urbana, Illinois, a corresponding member.

Mr. Renwick read from "Mackintosh's Electrical Theory of the Universe," regarding the revolutions of the planets, after which some time was spent in discussion of the subject.

Prof. H. W. Parker delivered a lecture before the Academy on March 27th, at LeClaire Hall.

APRIL 3D, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

C. H. Eldridge was elected a regular member. Dr. W. J. Barbee, of Carrollton, Mississippi, was elected an honorary member.

The following question was discussed: "Is it more healthful to sleep with the head north, than in any other direction?"

APRIL 4TH, 1868.—REGULAR MEETING.

Vice-President Barler in the chair.

Three members present.

No business done.

APRIL 17TH, 1868.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Three members present.

No business done.

MAY 1ST, 1868.—ADJOURNED MEETING.

Vice-President Barler in the Chair.

Six members present.

Dr. H. B. Wilcox, of Three Oaks, Mich., and Prof. H. W. Parker, were elected honorary members.

Mr. W. H. Pratt read a paper on "The Relation of the Outer World to our Senses."

MAY 29TH, 1868.—REGULAR MEETING.

Vice-President Barler in the Chair.

Seven members present.

It was voted to amend the By-Laws, so as to have the regular meeting on the last *Friday*, instead of *Saturday* of each month.

Mr. Renwick read a "Sketch of Observations during a trip far up the Mississippi."

On motion of Dr. Roundy, it was voted that a copy of all the scientific papers read before the Academy, be deposited in the archives of the Society.

JUNE 27TH, 1868.—REGULAR MEETING.

Vice-President Barler in the Chair.

Six members present.

The Secretary read a letter of acceptance of corresponding membership, from Mr. N. H. Parker, of St. Louis; also a published letter from Dr. Parry.

AUGUST 7TH, 1868.—REGULAR MEETING.

Mr. L. T. Eads in the Chair.

Nine members present.

George H. French and J. S. Seymour were elected reg-

ular members, and Dr. W. H. Stennett, of Bloomington, Ill., was elected a corresponding member.

Mr. Thompson read a paper on "Glimpses of Science, as seen by a Tyro."

Early in 1868, the Academy assumed the assets and liabilities of the Workingmen's Library Association, thus obtaining their library and a book case.

A very liberal offer was received and accepted from the Young Men's Library Association, to have the Academy deposit its Cabinet, and hold its meetings in the Library Rooms, Corner of Second and Brady streets.*

SEPTEMBER 4TH, 1868.—REGULAR MEETING.

Vice-President Barler in the Chair.

Ten members present.

Charles Glaspell was elected a corresponding member.

Dr. Parry gave a sketch of his observations made on trips through the western wilds, giving a brief description of the climate, vegetation, animals, minerals, and other features of the rainless and mountainous regions of the west.

Some time was spent in discussing the matter of the purchase of a telescope, offered by Mr. Lighton.

Messrs. Eads, Parry, and Roundy were appointed a committee to solicit subscriptions for the purpose.

OCTOBER 2D, 1868.—REGULAR MEETING.

Dr. Parry in the Chair.

Seven members present.

Messrs. John N. Crawford, P. B. Jones, and Dr. E. H. Hazen, were elected regular members.

Dr. Parry read an account of the recent ascent, by an exploring party, of "Long's Peak," hitherto considered inaccessible, illustrating it with some remarks upon his own experience at the same place.

*Here the Academy continued to hold its meetings until the fall of 1872.

The Secretary presented the resignation of Prof. Sheldon, as President of the Academy, on account of ill health, and pressure of professional duties.

On motion, the resignation was accepted, and the Secretary was required to give notice of an election at the next regular meeting, to fill the vacancy.

Mr. Thompson made some remarks relative to the long and patient labors, and devotion to science of the late M. Boucher de Perthes, one of the pioneers in the discovery and correct interpretation of the "flint implements," in the valley of the Somme.

OCTOBER 9TH, 1868.—REGULAR MEETING.

Dr. Parry in the Chair.

Thirteen members present.

Messrs. Howard Darlington, Edward Russell, J. S. Conner, Wm. Gray, Rev. S. M. Anderson, S. P. Bryant, and J. H. Melville, were elected regular members.

The Academy then proceeded to the election of President, to fill the vacancy caused by the resignation of Prof. Sheldon, and Dr. C. C. Parry was unanimously elected.

The President elect was conducted to the chair, and delivered a short address.

The Secretary presented the following resolution, which was adopted:

Resolved, That the position in the "Board of Trustees" to which Mr. C. S. Ells was elected, be declared vacant by non-acceptance, and that the Academy proceed at next meeting to elect a Trustee to fill the vacancy.

Mr. Eads read a paper on "Magnetism and the Magnetic Needle."

Dr. Parry was requested to prepare such amendments to the Constitution of the Academy, as he may deem desirable, to be presented at his earliest convenience.

Dr. Parry called the attention of the members to some excavations now being made in and near the city, recommending that an examination be made of those localities, with measurements, and that specimens be procured.

NOVEMBER 13TH, 1868.—REGULAR MEETING.

President Parry in the Chair.

Sixteen members and several strangers present.

Messrs. Iles, Jas. Renwick, and Thompson were appointed a committee of three to draft a suitable letter of acknowledgment to Dr. Farquharson, for his very valuable donation to the Library, of the Bulletin des Sciences Nationales, Paris, Vols. 1 to 27.

Mr. Eads reported that he had obtained subscriptions toward the purchase of the telescope, to the amount of \$30.

A letter was read from the Secretary of the Portland (Me.) Society of Natural History, proposing an exchange of specimens.

Dr. B. Atkinson was elected a regular member.

The Academy proceeded to the election of one Trustee to fill the vacancy caused by the non-acceptance of Mr. Ells, resulting in the unanimous election of Hon. Jno. L. Davies.

Dr. Iles read an interesting and instructive paper on "Animalcule Life, and its Relation to the Propagation of Disease."

Dr. Parry read a copy of a letter from Mr. Jas. White, dated September, 1868, verifying and describing his passage down the Colorado of the West.

Brief descriptions were given, by several members, of the deposits of peat, etc., exposed by excavations west of the city.

Prof. Lighton, of Rock Island, made some remarks concerning the telescope manufactured by him for the Academy, and on the desirability of obtaining photographs of the total eclipse of the sun, to occur August 7th, 1869.

The President stated that some arrangements had been made for observations of the meteoric shower expected to-night, and requested the attendance and aid of members and others present.

Meteoric Shower.

A cloudy evening presented a rather discouraging prospect, but about ten o'clock the clearing sky gave more favorable indications. Accordingly several members of the Academy and some visitors re-

paired to the place selected, a private observatory, the use of which was kindly offered by O. H. Child, Esq.

The clouds grew thinner, until about midnight, when the sky became tolerably clear, and continued so until near six A. M., when it was again overcast. A slight haze prevailed throughout the night, sufficient to obscure the meteors somewhat, and to affect their apparent color.

At twelve o'clock a meteor was occasionally seen, and at 12:15, about twenty having been noticed, an observer was stationed at each of the four sides of the observatory, and two Secretaries at a table within; and at 12:19 the first meteor was registered.

Up to 1 o'clock were registered.....	48
From 1 to 2 o'clock were registered.....	151
" 2 to 3 " " " 	167
" 3 to 4 " " " 	248
" 4 to 5 " " " 	628
" 5 to 6 " " " 	130

Total.....1,372

Very few remarkable ones were seen.

Almost all moved in lines radiating from constellation Leo as a center, only five being marked "retrograde." No explosions were seen and none of the meteors produced any sound.

Nearly all were white, or so very slightly tinged (either yellowish or bluish) as not to be marked "colored." The colored ones registered were red, 12; blue, 24; bluish green, 8.

Many exhibited short trains, disappearing almost instantaneously, which were not noted.

The average brilliancy was about that of a star of the third magnitude.

Average time visible about $1\frac{1}{4}$ seconds.

The only very remarkable meteor appeared at 1:20' 15" at 15° north of east, 45° high, and moved toward the zenith in a somewhat zigzag course, disappearing at 80° high. It appeared reddish at first, but changed to bluish green and was very brilliant, and visible about six seconds. Its whole substance then seemed to change into a vaporous train, somewhat serpentine in form at first, then settling into a broad, white line, and disappeared in about ten minutes.—
[W. H. Pratt.]

DECEMBER 11TH, 1868.—REGULAR MEETING.

Dr. Hies in the chair.

Thirteen members present.

Rev. Jas. Challen, Drs. R. J. Farquharson, T. J. Saun-

ders, L. French, Messrs. E. P. Lynch, D. D. Babcock, and L. B. Paine, were elected regular members.

Dr. Iles gave a brief account of some recent discoveries in Animalcule Life.

Dr. Farquharson read a paper on "Venomous Serpents." Some time was spent in general discussion of the subject of venomous bites and antidotes.

JANUARY 8TH, 1869.—REGULAR MEETING.

Two members present. Adjourned to January 11th.

JANUARY 11TH, 1869.—ADJOURNED MEETING.

President Parry in the chair.

Eleven members present.

Mr. French, chairman of committee to procure subscriptions for purchase of telescope, reported \$73 subscribed and collected.

Dr. Parry reported, that in compliance with the request of the Academy, he had examined our Constitution, and comparing it with constitutions of other similar societies, had made some notes of alterations which he recommended. Messrs. Eads and Thompson were appointed to act with Dr. Parry as a committee to draft amendments to the constitution, and present them at the next meeting.

The Secretary read letters from the Smithsonian Institution, Portland Natural History Society, Buffalo Natural History Society, &c.

Dr. R. F. Baker, E. P. Haddix, Wm. C. Hall and Gordon Warwick were elected regular members.

Mr. W. H. Pratt presented a report of his explorations at the railroad grade, west of the city; the excavations now in progress having exposed a fine section of the bluff foundation.

Some time was spent in a general discussion of the subject by Dr. Parry and others.

FEBRUARY 12TH, 1869.—REGULAR MEETING.

President Parry in the chair.

Eleven members present.

Some correspondence was read from the Buffalo and Portland Societies.

Mr. Geo. E. Wood, John Evans, and J. S. Teese, were elected regular members; and Miss Lizzie Allen a corresponding member.

Dr. Parry presented a series of amendments to be acted upon at next meeting.

Mr. Thompson read a paper on "Science as an Educator."

MARCH 12TH, 1869.—REGULAR MEETING.

President Parry in the chair.

Seventeen members present.

On motion, a vote of thanks was tendered to Mr. N. Fejervary, for his donation of valuable books.

Dr. M. B. Cochrane, Wm. F. Ross, and S. J. Sanger, were elected regular members.

Wm. N. Byers, of Denver, Col., H. N. Bolander, San Francisco, Hon. G. W. Clinton, Buffalo, N. Y., Dr. A. Wislizenus, of St. Louis, and Dr. John Torrey, New York, were elected corresponding members.

The following amendments to the Constitution and By-Laws were then read and adopted, and the Secretary was instructed to transcribe the Constitution and By-Laws, as amended.

CONSTITUTION.

ARTICLE 1ST. Not amended.

ART. 2ND. Not amended.

ART. 3D. The Academy shall consist of Resident, Life, Corresponding, and Honorary members.

ART. 4TH. Resident members shall be elected in the manner hereinafter prescribed, from among persons interested in Science, residing within fifty miles of Davenport, Iowa, and any resident member may at any time after his election, become a life member by paying into the Treasury of the Academy, the sum of Two Hundred Dollars, and notifying the Secretary that he desires to be enrolled as a Life member. The business of the Academy shall be exclusively man-

aged by, and the officers selected from, the Resident and Life members.

ART. 5TH. Corresponding members shall be elected in the manner hereinafter prescribed, from persons not residing within fifty miles of Davenport, Iowa, and any Resident member removing from within these limits will become a corresponding member—provided, that his dues have been paid up to the date of his removal, and he notify the Secretary that such is his wish.

Corresponding members moving within these limits may become Resident members by complying with the obligations of the latter—paying initiation fee and annual dues.

But in case of not complying with these requirements, they shall then cease to be corresponding members, except that Ladies may be elected and enrolled as corresponding members, irrespective of their place of residence.

ART. 6TH. Honorary members shall have all the privileges of Resident members excepting those of voting and holding office. They shall not exceed forty in number, twenty of whom shall be residents and citizens of the United States, and twenty of foreign countries.

ART. 7TH. Each candidate for Resident membership must be proposed in writing by at least two other Resident or Life members, at a regular meeting preceding the election.

Corresponding members shall be elected in the same way as Resident members, and the number of these classes is unlimited. Honorary members shall only be elected at the annual meeting, and must have been proposed at a previous meeting.

All members shall be elected by single ballot, and must have received the votes of at least four-fifths of the members present. Any rejected candidate shall not be eligible for membership within one year after the time of such rejection.

ART. 8TH. Same as former Art. 6th.

ART. 9TH. The offices of the Society shall be a President, Vice President, and Secretary, who shall be elected at the annual meeting, and hold their offices one year, or until their successors are elected and qualified; and vacancies occurring from any cause shall be filled by ballot at any regular meeting, due notice of the same being given by the Secretary.

ARTICLES 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23 not changed.

BY LAWS AS AMENDED.

ART. 1ST. The regular meetings of the Academy shall be held on the first Wednesday in each month. The annual meeting shall be held on the first Wednesday in January, at which time the general

election of officers of the Academy for the ensuing year shall be held, and the Reports of the officers for the past year shall be then presented, including a general statement from the President of the condition of the Academy.

ART. 7TH. Every Resident member elected shall pay an initiation fee of Five Dollars, also a semi-annual assessment of One Dollar; but Life, Corresponding, and Honorary members shall be exempt from the payment of dues.

ARTICLES 2, 3, 4, 5, 6, 8, 9, 10, and 11 not changed.

The list of Honorary members to be transferred to corresponding members.

Dr. E. H. Hazen read a paper on the "Human Eye."

Dr. Parry called Mr. French to the chair, and delivered the following,

Valedictory Address.

Gentlemen of the Davenport Academy of Natural Sciences :

It had been my intention in watching the practical workings of this Academy, to suggest certain modifications, and courses of action, such as in my judgment might conduce to its present efficiency and prospective usefulness; but I did not expect thus early and prematurely to be called on to dissolve my pleasant connection with its active membership. While, under these circumstances, I feel that any extended considerations would be unwarranted, I cannot, in justice to my own feelings, and the friendly courtesy which has placed me in the position of your presiding officer, neglect this opportunity to make a few suggestions in reference to the Academy's future management and prospects.

The objects of such an Academy of Natural Sciences, as indicated in its constitution, are the cultivation of a taste for Natural History pursuits, and the stimulation of research in the different branches of science, by those whose cultivated tastes and educated abilities qualify them for such work.

The first object specified exhibits the relations which such an institution sustains to the community in which it is located. The second has particular regard to its active membership. How can these most desirable objects be best accomplished, is the practical question for our consideration.

And in order to awaken a general interest in the observation and study of natural objects and local phenomena, we need, first and foremost, collections in all the separate departments of Natural History, classified and properly displayed before the eye, so as to suggest at once ideas of order, system and plan—in brief, we must have museums whose contents must be accessible and attractive to the observing

public, and thus serve to convince those who may be otherwise absorbed in business pursuits, that there are objects of study at least deserving the attention and regard of a progressive, utilitarian age. When such collections are once fairly commenced, even on the most limited scale, the peculiar individual tastes, and appetites, or even the accidental biases of different minds, will be attracted to the various branches of science so exhibited, and we shall see gradually growing up under its influence *workers* prepared to follow out particular lines of research and investigation. In this way the objects and aims of such an association will be best and most speedily attained in diffusing and increasing a knowledge of Natural Science in the community where it is located.

In the comprehensive view of the case, we see the particular need of such an institution, particularly in its early stages of growth, viz: A *permanent location*, where its objects can be properly displayed, and affording room for necessary enlargement. This want will become more pressing as collections enlarge, and is even now beginning to be seriously felt in the necessities of this Academy. We have a name, and a good one—we now want a “local habitation,” and where shall we find it? In older communities where the ordinary course of business is more settled, and where there is less strain upon the mental faculties in the pursuit of wealth, or where wealth has been accumulated to such an extent that it becomes a point of earnest inquiry to know how it may be best used, we not unfrequently meet with those who assume a wise patronage of science, and aim to place institutions designed for its promotion in the possession of necessary funds. To such wise promptings we owe the rich endowments of eastern colleges, or the munificent gifts of Peabody. But here in the west where every one is intent on securing wealth by the most rapid process, or having thus attained it, continue to cherish the excitement of gain to the exclusion of higher motives, we cannot expect to meet with patrons of science who will take such institutions under their fostering care. Perhaps our Davenport *Peabody* is being lulled to sleep in its nurse's arms, or has not yet appeared upon the stage of existence. Therefore, in the long intervening period, the Davenport Academy of Natural Science must reasonably look to other sources for its successful continuance. The plan of life membership affords the most feasible plan of securing the necessary means for procuring a permanent location, and could sufficient interest be awakened on this subject among our active, prosperous business men, something might be done to secure the desirable consummation. How this may be most speedily accomplished does not yet appear, but I trust that gentlemen here who have been active in the organization of this Academy will keep this object in view till something definite is brought about in the shape of a permanent location. Till this is done we shall be at the mercy of the elements of fire and water—if not earthquakes—and if

subject to frequent removals, might as well have a few strokes of the latter to assist in the *moving* process.

Again, as I have had frequent occasion to remark, the educational claims of Natural Science are but very dimly appreciated, even in this utilitarian age and country, whose astonishing progress is largely due to the applied results of scientific investigation. We are profuse in our expenditure of funds raised by general taxation to impart a knowledge of dead and living languages, or the dull abstractions of technical grammar, or the relations of numbers, neglecting almost entirely the things and living objects that enter so largely into the observations and wants of every day life. As long as the community at large is satisfied with this kind of education, and is willing to pay well for it, so long will educators neglect Natural Science, and teachers as a class will keep aloof from the meetings of such an Academy as this. But let the claims of Natural Science be once fairly admitted, and we shall have scores of teachers crowding within these halls, consulting our museums, and libraries, taking an active part in our exercises, while at present we can barely number two worthy representatives of this important class. No small honor will in after times attach to those who uphold the cause of science, as an educational power, during the period in which it is little esteemed, or regarded as visionary and Utopian in its aims and purposes.

Another tendency which in such a young, undeveloped institution it is necessary to guard against, is a disposition to run into loose theorizing and a presentation of subjects in their purely theoretical aspects, vague, shadowy and undefined. While it is eminently proper that our discussions of suitable subjects should be allowed to take the widest possible range, and nothing professing to be true should be excluded from a free and fair exhibition of its claims to attention, however much it may clash with our preconceived opinions, yet our chief and paramount duty is to collect substantial facts, arrange them properly, let them accumulate even in their roughest aspects, and leave them to be shaped afterwards, and construed into theories in which each ascertained fact shall represent a polished and well fitting block in the great temple of truth. Mud built, or *adobe* theories, may answer well enough for a temporary structure, but cannot be relied on to withstand the vicissitudes of an age that tries with its frost, and fire, and flood, everything that aims to rise above the common level, reducing all that is unsubstantial to its kindred dust.

I need only further remark, that as a local scientific institution, our chief efforts should be primarily directed to develop and bring to light the scientific raw material, and objects of interest, or the peculiar local phenomena by which we are surrounded. I think in this connection it is not sufficiently appreciated, as to the importance of early observations and collections in new localities. The natural Flora and Fauna of a country undergoes great changes in the progress

of civilized settlement, and the important law which regulates these changes, can only be properly understood in the light of comparison. I have been lately forcibly reminded of this fact by observing the remarkable changes which the natural vegetation in this vicinity has undergone within my recollection. Plants that twenty years ago I could find within range of a short walk from where we are now assembled, have now almost entirely disappeared from view. The "white man's foot" and the track of domestic cattle have induced changes sufficient to alter the whole aspect of vegetation. In many respects the changes are disagreeable in the substitution of introduced weeds of coarse and homely aspect, for the native denizens of the soil. The prairies that surround us to-day, are no longer the prairies of twenty-two years ago. Even a spot which I have religiously cherished as a botanizing ground, comparatively free from intrusion as the last resting place of the dead, has been taken possession of by the *blue grass* and *white clover*, and I can no longer find the *prairie primrose*, the *moccasin flower*, or the *gentian*, which formerly flourished there. I have noted the same kind of changes in process on the Rocky Mountain slopes. So that I feel the urgency and importance of early collections of Natural History to inform those who may come after us of the aboriginal aspects of our surrounding country.

The same is, no doubt, also true in regard to animals and insects. Introduced species supplant the native, till the organized aspects of a country become entirely changed. This fact is probably not as applicable to minerals, and geological formations, which Nature most carefully protects in her covered museums. Yet, still our coal beds and quarries, in being worked out, will cause a dearth of fossils and minerals that if early collected would serve to give a more complete view of the various formations they bring to light.

I mention these facts, gentlemen, as a motive for industry and perseverance in the important work of making *local* collections. It would no doubt be a matter of interest and curiosity to know something about the Flora of Japan, or the minerals and animals of Independent Tartary, or Central Africa; but our nearest duty lies at Home. History is here making every day, and it is one important part of our duty to give it a record and permanence in our collections and transactions.

It will also be very desirable to commence the issuing of publications and transactions as early as possible. By this means alone shall we be brought into intimate relations with kindred associations elsewhere, and be entitled to receive that class of publications that we need to keep us well posted in the movements and progress of scientific research all over the world. Such publications need not be very extensive or elaborate, but should be continuous. If neglected too long, our name as an Academy of Science will pass out of view, and our corresponding members will forget their membership. This sin-

gle suggestion is all that I feel authorized to offer at the present time.

In regard to membership I would recommend a rigid adherence to rules of admission and prompt payment of dues. No name, however desirable otherwise, should be allowed to remain on our list, if needlessly delinquent in this respect. We shall need *greenbacks* much more than mere names, and unless the latter come with this associated recommendation they had better be left out.

There are many other points to which I might profitably, on a different occasion, call your attention, but at present the subject may be safely left to your reflection and an enlarged experience of your progressive wants.

In now assuming the less responsible duties of a corresponding member, I trust I shall find no occasion to forget my pleasant associations with this pioneer society, or to feel any diminished interest in its growth and success. Twenty-five years of the most active period of my life have been passed in connection with this home locality. I have seen the village of one thousand inhabitants increase twenty fold. In a certain sense I have not been an idle spectator, though I have occupied no coveted field, or sought for personal emoluments that might have been within my reach, I have been at least a zealous student in Natural History, and have no higher ambition than to be so regarded. I have endeavored to see and understand as much as I could of the country and districts in which my lot has been cast. I have not hesitated, on all suitable occasions, to use my pen and my voice in behalf of the educational claims of Natural Science. And in now assuming similar duties in a distant locality, I have only to regret that I have not worked harder and accomplished more.

With most sincere thanks for the courtesy that has marked our past relations, I now present my resignation of the Presidency of the Academy, and ask to be enrolled on the list of its corresponding members.

On motion, it was voted that the Doctor's resignation be laid on the table,

On motion of Dr. Roundy, Messrs. Thompson, Tiffany, and Challen were appointed a committee to draft resolutions of acknowledgment of Doctor Parry's valuable labors for the benefit of the Academy.

APRIL 7TH, 1869.—REGULAR MEETING.

Two members present. Adjourned one week.

APRIL 14TH, 1869.—ADJOURNED MEETING.

George H. French in the chair.

Six members present.

Mr. Thompson of the committee appointed to prepare resolutions regarding the departure of Dr. Parry, presented the following report, which was adopted, and the Secretary was instructed to forward a copy to Dr. Parry.

REPORT OF THE COMMITTEE ON THE RESIGNATION OF DR. C. C. PARRY, AS PRESIDENT OF THE ACADEMY OF NATURAL SCIENCES, DAVENPORT, IOWA.

WHEREAS, Our esteemed President, Dr. C. C. Parry, having by his studious and laborious investigations in Science, attained a national, if not a world-wide reputation; and

WHEREAS, In consequence of said attainments, and reputation, he has been called to fill an important position at the Capital of the Nation, as Botanist in the Agricultural Department of the United States. Therefore be it

Resolved, That while deeply regretting the severance of our present pleasant and profitable relations, and the absence of his personal presiding presence among us, yet we heartily rejoice at the national appreciation of his talents, and his entrance upon the broader field of usefulness to which he has been called in consequence; and

Resolved, That wherever he goes, or in whatever sphere of usefulness he may be called to labor in the future, he will carry with him our best wishes for his health, happiness, and prosperity; while we shall always cherish a lively remembrance of his connection with us, and endeavor to imitate his example, equally in his zeal as a scientist, his duties as a citizen, and his suavity as a man.

Resolved, That believing it is for the best interests of our infant Academy, that Dr. C. C. Parry should for the present, still be connected with it as President; therefore, if agreeable to him, we will still retain that relation nominally, so that by the prestige of his name, as well as by his advice and counsel, (though at a distance,) we may the sooner attain that scientific excellence, which will enable some "coming man," to fill his chair with ability and success.

Resolved, That these resolutions be placed upon the minutes of the Academy, and a copy of the same be forwarded by the Secretary to Dr. C. C. Parry, at Washington, D. C.

JUNE 2D, 1869.—REGULAR MEETING.

Mr. James Thompson called to the chair.

Few members present.

It was voted to amend the By-Laws, so as to have the regular meeting on the last *Friday*, instead of the first *Wednesday* of each month.

Messrs. Henry Tourtillotte, J. Duncan Putnam, and Mrs. C. E. Putnam, were elected regular members.

JUNE 25TH, 1869.—REGULAR MEETING.

Mr. Jas. Thompson in the chair.

Seven members present.

Prof. Lighton of Rock Island, made some explanations regarding the means of observing the eclipse of the sun on the 7th of August. After some discussion of the subject, Mr. Gray moved that the chair appoint a committee of three members, to confer with Prof. Lighton, and Dr. Parry, in reference to the necessary action, and the means required to procure photograph negatives of the eclipse. The motion was carried, and the chair appointed Dr. Hazen, Dr. Roundy, and W. H. Pratt, as such committee.

JULY 9TH, 1869.—ADJOURNED MEETING.

Vice President Barler in the chair.

Nine members present.

Dr. Roundy of committee on preparation for the eclipse reported that the instruments and articles required would cost, so far as could now be determined, from forty to fifty dollars.

The Secretary read a letter from Dr. Parry, and in accordance with his suggestion it was resolved that the Academy endeavor to procure subscribers for photographs of the eclipse at a price sufficient to meet the expense likely to be incurred.

Messrs. Hazen, Pratt, Jones and Roundy were appointed a committee of four, to fix the price and terms, and procure subscribers, if practicable.

JULY 16TH, 1869.—ADJOURNED MEETING.

Vice President Barler in the chair.

Sixteen members present.

Dr. Hazen, Chairman of the committee on preparation for eclipse, and also of the committee on procuring subscriptions

reported that it was considered impracticable to procure subscribers in advance for photographs, it being impossible to make any definite terms guaranteeing copies to subscribers; and, further:

That Prof. Lighton and Mr Jones proposed to give their services on the occasion for the benefit of the Academy without charge, except for materials furnished by them, it being understood that the negatives, if any are obtained, shall be the property of the Academy, and under the control of the "Board of Trustees," the same as other property belonging to the Academy. The report was adopted and the committee discharged. On motion of Mr. Eads, it was

Resolved, That Dr. E. H. Hazen, P. B. Jones, Thos. Lighton, Dr. Roundy, and W. H. Pratt be and are hereby appointed an Executive Committee to carry through the project of taking photographs of the solar eclipse, and to arrange and perfect all the details, as in their judgment shall seem best.

On motion of Mr. Jones it was voted that the meeting ascertain how much can be secured now and here for the purpose of defraying the expenses, and a subscription paper was drawn up, and \$50 subscribed by the members present.

On motion, the Secretary was appointed to solicit additional subscriptions.

It was moved that the money subscribed be paid to the Treasurer, and the committee be authorized to draw for the same as required. Carried.

JULY 30TH, 1869.—REGULAR MEETING.

Vice-President Barler in the chair.

Twelve members present.

The Secretary reported progress in obtaining subscriptions to the eclipse fund, having had \$40 added to the list by members, and \$10 by N. Fejervary, Esq., who is not a member.

On motion, a vote of thanks was presented to Mr. Fejervary, for his donation.

Chas. E. Putnam, of Davenport, and Thos. Lighton, of Rock Island, were elected regular members.

The chairman then announced that several microscopes had been brought, with suitable objects for examination, and that they would be arranged for use after adjournment of the meeting.

ECLIPSE OF THE SUN.

According to previous arrangement, the instruments which had been made for the occasion of the eclipse, by Mr Thos. Lighton, of Rock Island, with the apparatus furnished by Mr. P. B. Jones, Photographer, of Davenport, were put in position on the roof of Jones' Photograph Gallery, and arranged for use.

The morning of August 7th, dawned bright and clear, and with the exception of a few white clouds in the west, the sky was unexceptionable; these cleared away before noon, and at the time of the eclipse no brighter sky ever encircled this region.

The time of the commencement of the eclipse was 3h 57' 53", and the last appearance of the moon on the face of the sun was at 5h 57' 27". The duration of totality was 63 seconds.

There were thirty-six photographs taken, including one of the full sun just before the appearance of the moon upon its face. About twenty of these are fairly executed.

The thermometer ranged from 70° to 65.5°. During totality it stood at 66.5°. The barometer stood at 29.62 inches during the whole eclipse. The wind was from the north-east.

AUGUST 9TH, 1869.—SPECIAL MEETING.

Vice-President Barler in the chair.

Eleven members present.

The chairman stated that the object of the meeting was to receive the report of the committee on photographing the eclipse, and to determine matters regarding the printing and disposal of photographs.

Dr. Hazen, chairman of committee, reported that some twenty-four negatives had been made, which the committee wished should now be taken charge of by the Trustees.

It was voted that the executive committee be authorized to fix the prices, and order from Mr. Jones such number as they think proper, not exceeding five hundred, and to dispose of the same.

On motion of Mr. Eads, it was voted to present to Mr. Lighton three full sets, to Mr. Jones one set, to Mr. Bow-

man one set, to Mr. Gayford one quarter set, and to Mr. Newbury one quarter set of the photographs, for their efficient aid in taking photographs of the eclipse.

The following resolution presented by Mr. Thompson, was adopted:

Resolved, That the thanks of the Academy are tendered to Messrs. Cressy, Neely, Baldwin, Murray, and to each and all who in any way assisted in photographing the eclipse on the 7th inst.

AUGUST 20TH, 1869.—SPECIAL MEETING.

Dr. Roundy in the chair.

The chairman stated that the object of the meeting was to take steps toward celebrating the centennial anniversary of the birth of Baron Humboldt.

On motion of Mr. Thompson, Mr. Otto Smith, was appointed to confer with the German Societies, that were preparing to celebrate the anniversary of the birth of Humboldt, and make report as to the best course to be pursued in joining with them for that purpose.

Prof. Campbell, of Jacksonville, Ill., upon invitation, gave an account of the steps taken in his place toward the formation of scientific meetings.

AUGUST 24TH, 1869.—REGULAR MEETING.

Vice-President Barler in the chair.

Eight members present.

Dr. E. H. Hazen, chairman of executive committee on photographing the eclipse, presented a set of the photographs, bound in book form, together with a report of the observations, printed and bound with them.

The Secretary was instructed to forward to the U. S. Naval Observatory the photographs and report presented by the committee, together with Prof. Sheldon's report of observations at Griswold College.

Dr. D. C. Roundy read a paper on "Hydrophobia," treating of the nature of the disease and means of preven-

tion, what animals are subject to it, how communicated to others, &c. A short time was spent in discussion.

OCTOBER 28TH, 1869.—REGULAR MEETING.

Vice-President Barler in the chair.

Twelve members present.

H. H. Henderson, J. B. Young and Miss Chapin, were elected regular members.

The Secretary reported the receipt of a volume of *Astronomical Observations*, of 1866, from U. S. Naval Observatory, in exchange for a set of photographs of the eclipse sent them, with report of observations; also the 12th volume of *Proceedings of the Boston Society of Natural History*, received from that Society in return for a box of specimens sent them.

W. H. Pratt, of committee to procure subscriptions to defray the expenses of photographing the eclipse, reported that he had procured as much as was practicable, and turned over the amount with the subscription paper to the Treasurer.

Mr. Tiffany gave an account of some bones discovered by him, buried in the soil, in a prairie slough, in Henry county, Illinois, and presented them to the Academy.

Mr. A. S. Tiffany then read a paper on "Correlation of Forces."

NOVEMBER 5TH, 1869.—SPECIAL MEETING.

President Parry in the chair.

Seventeen members present.

At the request of members, Dr. Parry gave a highly interesting account of his recent exploring trip in Colorado, from which he was then on his return to Washington.

JANUARY 28TH, 1870.—REGULAR MEETING.

Mr. James Thompson in the chair.

Eleven members present.

John L. Swits was elected a regular member.

Dr. Hazen, chairman of committee on photographing the eclipse, reported progress, and recommended that the members should purchase copies to meet the deficiency in the fund raised to pay expenses.

Dr. Farquharson read a paper on the subject: "Do rifle balls, when stopped by the animal body, burn?"

FEBRUARY 25TH, 1870.—REGULAR MEETING.

Mr. L. T. Eads in the chair.

Seven members present.

A letter was read from J. F. C. Hays, of Des Moines, to Mrs. Sanders of this city, offering a collection of minerals, &c., for sale.

Mr. Andrew Bunker was elected a regular member.

APRIL 29TH, 1870.—REGULAR MEETING.

Dr. Hies in the chair.

Twelve members present.

Some discussion was held regarding the feasibility and means at our command of making collections of materials for exchange, for benefit of the Academy collection, and it was determined that each member should be prepared to report at next meeting, as to what he can probably do.

MAY 27TH, 1870.—REGULAR MEETING.

Vice-President Barler in the chair.

Seven members present.

Some time was spent in discussion upon the subject of lightning rods, and insulation.

JUNE 23D, 1870.—REGULAR MEETING.

Vice-President Barler in the chair.

Eight members present.

Mr. Eads presented the following resolution, which was adopted:

WHEREAS, Prof. Gustave Hinrichs, of the Iowa State University,

has commenced the publication of a scientific periodical; Therefore, be it

Resolved, By this Academy of Science, that we hail with joy the publication of such a journal within the borders of our State, by a gentleman so well qualified for the task, and that we hereby pledge him our support and encouragement.

A short time was spent in informal discussion on various subjects.

AUGUST 25TH, 1870.—REGULAR MEETING.

Vice-President Barler in the chair.

Seven members present.

Some time was spent in irregular discussion and remarks by various members.

SEPTEMBER 30TH, 1870.—REGULAR MEETING.

Four members present. No business done.

OCTOBER 28TH, 1870.—REGULAR MEETING.

Vice-President Barler in the chair.

Nine members present.

Mr. Barler called Dr. Hazen to the chair, and read a paper on "The Progress of Science," especially in the department of Astronomy.

A committee consisting of Messrs. Barler, Pratt and Thompson, were appointed to arrange for a series of meetings or lectures, so as to increase the interest in the Academy.

NOVEMBER 25TH, 1870.—REGULAR MEETING.

Vice-President Barler in the chair.

Seven members present.

The chairman of the committee on lectures, reported different invitations which had been sent to lecturers, and the replies received, which were mostly favorable. And further, that they were about closing a contract with Prof. W. J. Beal, for a course of five lectures during next month,

and had raised by subscription almost one hundred dollars to pay expenses of the lectures.

Mr. Barler presented a proposition to amend Article 9, of the Constitution, by inserting the words, "a Corresponding Secretary and a Recording Secretary," instead of "a Secretary."

Dr. Hazen read a paper on "The Physiology of the Eye," describing its condition in cases of blindness, and giving a detailed explanation of the various parts of the eye, and the action of light upon it, &c., &c.

During the month of December, Prof. W. J. Beal, of Chicago, delivered before the Academy a series of five very interesting and instructive lectures upon Geology.

DECEMBER 30TH, 1870.—REGULAR MEETING.

Vice-President Barler in the chair.

Eight members present.

R. B. Hill was elected a regular member.

The amendment to the Constitution proposed at the last meeting was adopted.

Mr. Tiffany made some remarks regarding the attraction of matter for matter, as shown in some experiments, which he described.

JANUARY 27TH, 1871.—REGULAR MEETING.

Vice-President Barler in the chair.

Nine members present.

Prof. W. E. Crosby was elected a regular member.

Mr. Malvern Iles was appointed to invite the youth of the city, of both sexes, to attend the next regular meeting of the Academy, at which time Dr. Hazen will read a paper on the Physiology of the Eye.

FEBRUARY 24TH, 1871.—REGULAR MEETING.

Dr. T. J. Iles in the chair.

Forty-six persons present.

On motion, the regular business was dispensed with, and Dr. E. H. Hazen proceeded to read a paper on the Physiology of the Eye.

A resolution was adopted approving of the course of lectures on Geology, lately delivered by Prof. W. J. Beal, and recommending him to other Societies.

MARCH 31ST, 1871.

Meeting adjourned on account of a lecture for the Academy, by Prof. G. Hinrichs, this evening, at the City Hall, on the "Treasures of the Deep."

APRIL 3D, 1871.—ADJOURNED MEETING.

Vice-President Barler in the chair.

Five members present.

J. D. Putnam proposed the following amendment to Art. 4th of the By-Laws, viz: to substitute *Recording Secretary* for *Secretary*, in the first paragraph, and *The Corresponding Secretary* for *He*, in the second paragraph; striking out the word *also*.

APRIL 28TH, 1871.—REGULAR MEETING.

Vice-President Barler in the chair.

Five members present.

Rev. A. Lounsbury was elected a regular member.

The amendment to the By-Laws proposed at last meeting was adopted, and the Academy then proceeded to the election of Corresponding and Recording Secretaries.

W. H. Pratt was elected Corresponding Secretary, and J. Duncan Putnam, Recording Secretary.

MAY 26TH, 1871.—REGULAR MEETING.

Dr. Iles in the chair.

Six members present.

Mr. Tiffany read a letter from Prof. Eams, of Duluth, Minn., stating that he would be glad to send the Academy

specimens of minerals, etc., from the northern shores of Lake Superior.

A short time was spent in discussion upon various subjects.

JUNE 30TH, 1871.—REGULAR MEETING.

Few members present. Meeting adjourned until July 1st.

JULY 1ST, 1871.—ADJOURNED MEETING.

Only four members being present, no meeting was held.

SEPTEMBER 29TH, 1871.—REGULAR MEETING.

Vice-President Barler in the chair.

Nine members present.

Mr. Pratt reported a letter from Prof. Winchell, of Ann Arbor, Michigan, proposing to deliver a series of lectures during the winter.

Dr. Iles gave an account of the Quaking Springs of Missouri.

OCTOBER 27TH, 1871.—REGULAR MEETING.

Vice-President Barler in the chair.

Six members present.

On motion of Dr. Iles, a committee was appointed to make arrangements for a series of lectures from Prof. Winchell.

Mr. Barler exhibited before the Academy some specimens from the Niagara formation in Iowa. There was a discussion on the contraction and expansion of ice, and also on the terms "force" and "momentum," as used in most works on Natural Philosophy.

In November, Prof. Alexander Winchell, of Ann Arbor, delivered four interesting lectures before the Academy, upon the History of Creation.

DECEMBER 29TH, 1871.—REGULAR MEETING.

Vice-President Barler in the chair.

Seven members present.

A committee was appointed to inquire into the feasibility of having another course of lectures from Prof. Winchell, to report in two weeks to the Corresponding Secretary.

JANUARY 3D, 1872.—ANNUAL MEETING.

The evening was spent in an interesting discussion on various topics. No business was done.

JANUARY 26TH, 1872.—REGULAR MEETING.

Vice-President Barler in the chair.

Eight members present.

Rev. Emory Miller was elected a regular member.

Mr. Tiffany read an interesting paper on Kerosene and other illuminating oils, which was followed by a short discussion of medical uses of kerosene.

APRIL 26TH, 1872.—REGULAR MEETING.

Mr. A. S. Tiffany in the chair.

Four members present.

FRIDAY, MAY 24TH, 1872.—REGULAR MEETING.

President Parry in the chair.

Eight members present.

Dr. Hazen mentioned that the Academy would soon have to move from its present location in the Library rooms. Dr. Hles moved that the three Trustees present, Messrs. Parry, Pratt and Tiffany, be appointed a committee to confer with the School Board, about removing the cabinets to the High School building, and to act in conjunction with the committee appointed by the Trustees, and to report at the next meeting. Carried.

Richard Mansel was elected a regular member.

Dr. Parry spoke of the recent discovery, in New York, of a new parasite, that is proving very destructive to the black spruce, and exhibited specimens. It is a species of

Arceuthobium, a genus related to the Mistletoe, not heretofore found east of the Rocky Mountains, but is now threatening the existence of that fine tree, in various places. It is very small—about one inch in length, and the sexes are invariably found on different branches.

Mr. Putnam exhibited some specimens of *Amphicerus bicaudatus*, Say, which he had lately found boring in the canes of the Concord grape, in a suspicious manner. It is a chestnut brown, cylindrical beetle, about half an inch long. It makes a hole at the *eye*, about an eighth of an inch in diameter, and forces its way for a distance of from one to three inches. Usually but a single specimen is found in a cane, but sometimes there are more. The best way to destroy them is to cut off the cane containing them, and burn it.

Mr. Mansel made some remarks on his new "Theory of the Universe," and presented several of his pamphlets, for which he received the thanks of the Society. Upon request, the Secretary read a portion of one of his publications.

On motion of Dr. Iles, the Treasurer was asked to make a report on the indebtedness of each member to the Academy.

JUNE 14TH, 1872.—SPECIAL MEETING.

President Parry in the chair.

• Six members present.

Mr. Pratt, of the committee appointed at the last meeting, reported that they had applied to the School Board for permission to deposit our cabinet in the High School building.

Mr. Pratt stated that at the last meeting of the Trustees, it was voted to allow each member to pay such amount of his dues as he felt able, and to receipt him in full, to July 1st, of this year.

Mr. Gray spoke of a fossil which he obtained from a stone-cutter in Rock Island. Mr. Pratt said it was probably *Orthocerus annulatus*.

Mr. Pratt called the attention of members of the Academy to the large quantity of rock being brought from the neighborhood of Iowa City, and broken up and deposited as ballast upon the track of the C., R. I. and P. R. R., near the new Perry Street Depot.

He remarked that an unusual opportunity was thus afforded for the collection of Devonian corals and shells, of which these rocks contain great quantities of well marked, and well preserved specimens.

Mr. J. D. Putnam presented the following notes on

The Maple Bark Louse (*Lecanium acericola*, W. & R.)

During the past year the maples of this city have suffered greatly from the attacks of a bark louse, the *Lecanium acericola* of Walsh and Riley, (American Entomologist, Vol. I, page 14). Mr. A. S. Tiffany says his attention was first drawn to it in May, 1868, by Mr. McEwen, who had also noticed it the year before. Mr. Tiffany has noticed them every year since, each time in greater abundance. In 1870 they had become so abundant as to attract general attention. Last year they began to increase enormously, and threatened to destroy all the beautiful maples which adorn our city, but fortunately their enemies increased with still greater rapidity, so that we may hope to save most of the trees. These bark lice were in the greatest abundance in the very center of the city, near Third and Brady streets, and became less and less numerous towards the suburbs. I do not know of any having been noticed out of town. They seem to spread very slowly, and have probably been introduced on some young trees. They have also been noticed to occur sparsely, and probably accidentally, on the locust, and other trees.

When first noticed in the spring, the bark lice were scale like, of an oval shape, from one-tenth to three-tenths of an inch long, and of a light brown and gray color. As soon as warm weather set in they began to increase rapidly in size, until about May 20th, when they began to lay their eggs, which are enveloped in a silken mass projecting forward from the underside of the mother louse. They continued to lay eggs for about three weeks, when the young lice began to hatch out. The young lice are very minute, and of a honey yellow color. They are quite active, and overrun everything, but soon gather along the principal veins of the leaves and remain stationary. The eggs continued to hatch for about a week. During August most of the bark lice moulted, becoming of a mottled brown color, instead of honey yellow. Before the leaves begin to fall on the approach of winter, numbers of the lice seem to find their way from the leaves to

the limbs, where they remain during the winter, to begin over again in the spring. It is possible they may have been on the limbs all the time, unobserved.

The bark louse is attacked, in its different stages, by three species of lady birds,—*Coccinelidae*. The larvæ of *Hyperaspis normata*, Say, are found in considerable numbers preying on the eggs within the silken mass, and in this way destroy vast numbers of the lice. These larvæ are about one-fifth of an inch long, covered with a whitish down. The lady bird itself is about one-tenth of an inch long, of a shining black color, with a round bright red spot on each wing cover. The next most abundant species is *Chilocorus bivulnerus*, Muls. This beetle very much resembles the last, but is about twice as large, and the red spots are emarginate. The larvæ are gray, covered with spines, and seem specially to attend the young lice after they are hatched. When about to pupate they gather in large clusters near the forks of the limbs. The other lady bird is *Mysta 15-punctata*, Oliv., much larger than either of the others, of a drab color, with fifteen black spots. But few were noticed.

Many artificial remedies were tried, but none with success. Probably the best plan is to syringe the trees thoroughly while the young lice are hatching, in June, with a weak solution of some poison.

Owing to absence from town I have not yet been able to trace out a complete history of this bark louse.

Dr. Parry exhibited specimens of a new addition to the Flora of the West; the first from Iowa.

It was discovered by Mrs. Hedges, of Faribault, Minn., and was described by Prof. Gray, from specimens received of Miss S. P. Darlington, under the name of *Erythronium propullanes*. He also spoke of his recent trip on the D. & St. P. R. R. It was wonderful to see how the Prairie Flora has changed since he first crossed the prairies thirty years ago. An old town may usually be known by blue grass growing in the vicinity. It is very persistent and drives out nearly all other plants.

The President and Secretary then bade the Academy farewell for the summer, being about to depart on a botanical and entomological excursion to the Rocky Mountains.

JULY 26TH, 1872.—REGULAR MEETING.

Vice-President Barler in the chair.

Three members present.

Mr. W. H. Price was elected a regular member.

OCTOBER 25TH, 1872.—REGULAR MEETING.

President Parry in the chair.

Six members present.

Mr. Pratt, of the committee appointed to confer with the School Board, said that Dr. Olshausen, chairman of the committee appointed by the school board, had no objection to having the cabinet placed in the board rooms, (basement under the High School,) but could not let us have our meetings there. No action was taken on this report.

The President and Secretary having returned from Colorado, the results of their trip were discussed to some extent. Each reported a very enjoyable and successful season in their respective departments. The sanitary and other effects of the climate, and the elevation and depression of mountains in general, were discussed by the members present.

NOVEMBER 29TH, 1872.—REGULAR MEETING.

Held in the office of Putnam & Rogers.

President Parry in the chair.

Eight members present.

A communication was read from Dr. C. H. Harney, Waupun, Wis., Oct. 26th, 1872, giving an account of a supposed cure of hydrophobia, performed upon himself, with a "mad stone," some thirty-five years ago. After the communication had been read, Dr. Roundy made a few remarks, controverting many of the statements contained in the communication. Some discussion was held upon this subject.

Dr. Parry spoke of having recently visited a large salt marsh in Northern Kansas, about three hundred miles west of the Missouri river. This marsh covers an area of upwards of twelve hundred acres. A number of fresh water streams empty into it, and "Salt Creek" flows out. The plants growing in the marsh are similar to those found growing along the sea shore. Animal life is not very abundant, only a few fresh water shells (*Planorbis* and

Physa) were noticed. This bed of salt has been found to extend to a depth of at least sixty feet, and is probably inexhaustible. It is dry for about four feet from the surface, but when wells are sunk deeper, a very strong brine collects in them. It may be evaporated in large quantities by action of the sun alone, during the summer, as the climate is very dry. Dr. Parry exhibited a number of specimens of the salt in various conditions.

DECEMBER 13TH, 1872.—ADJOURNED MEETING.

Held in the office of Messrs. Putnam & Rogers.

Mr. A. S. Tiffany in the chair.

Seven members present.

Mr. Pratt read a letter from Mr. Woodman, of Dubuque, offering to furnish the Academy with a fine collection of Marine animals, for \$500, said collection being worth at least \$1,000.

Mr. Pratt read an elaborate paper on the "Tides," finely illustrated with diagrams.

JANUARY 8TH, 1873.—ANNUAL MEETING.

Mr. Wm. Riepe in the chair.

Five members present.

Mr. Pratt read a communication from Mr. Barler, resigning his position as Trustee of the Academy, he having moved beyond the township of Davenport.

On motion, Mr. Barler's resignation was laid over until the next meeting.

The Academy then proceeded to the election of officers for 1873, resulting as follows:

President—DR. C. C. PARRY.

Vice-President—DR. E. H. HAZEN.

Corresponding Secretary—W. H. PRATT.

Recording Secretary—J. D. PUTNAM.

The Academy then proceeded to the election of a Trustee.

tee in the place of the late Hon. J. L. Davies. Mr. E. P. Lynch was unanimously elected.

JANUARY 31ST, 1873.—REGULAR MEETING.

President Parry in the chair.

Seven members and two visitors present.

Mr. Tiffany made a verbal report on finances, showing over \$100 in the treasury.

Mr. Barler's resignation of his Trusteeship, was then taken up, and accepted. The vacancy to be filled by ballot, at the next meeting.

A letter was read from the wife of the late Dr. John Paul, of Ottawa, Ill., (a corresponding member,) announcing his death, and offering his cabinet for sale.

It was voted that two members be appointed a committee to confer with other associations in relation to the erection of a building, etc.

Dr. Parry and Mr. Tiffany were appointed to form this committee.

Mr. Churchill, who was present as a visitor, made some remarks on the museum of the Agricultural College at Ames, Iowa.

Dr. Parry mentioned that he had been appointed Botanist to a Military Expedition to the head-waters of the Yellowstone, Bighorn, &c., in Wyoming.

A vote of thanks was tendered the Putnam Bros., for printing the Constitution of the Academy.

FEBRUARY 28TH, 1873.—REGULAR MEETING.

President Parry in the chair.

Nine members present.

Dr. Parry, of the committee appointed to confer with committees from other societies, upon the subject of building, &c., reported that they had met several times, but had not yet decided upon any plan.

Mr. Tiffany desired to have some one else appointed to

his place on this committee, as he expected to be absent from the city. Mr. Lynch was appointed.

H. H. Benson and John Temple were elected regular members.

The Academy then proceeded to elect a Trustee, vice A. U. Barler, resigned. Mr. Charles E. Putnam was unanimously elected.

Mr. Tiffany then presented the following account of the
Discovery of Human Remains in a Shell-bed on Rock Island.*

On the Rock Island Arsenal grounds, near the western extremity of the Island, there had been an excavation, about three hundred feet long and eight feet deep. At a depth of three feet from the top is a deposit of shells, mostly *Unios*, but including *Melantho subsolidata*, and two or more species of *Helix*. This shell-bed, at this exposure, varies from six to sixteen inches in thickness. Accurate levelings prove the deposit to be eighteen feet above the highest water mark known since Fort Armstrong was established on the Island.

In the lower part of this shell-bed, at the point marked in the section (plate XXVI, fig. 1), were found the skull and bones belonging to one individual. The bones were quite fragile and easily fell to pieces, but a large portion of the skull was secured (Plate XXI, fig. 25.) There are many fragments bearing witness that the whole skeleton had been there. Associated with these human remains were found the point of an antler of a deer or elk, and what appears to be a fragment of the shin bone of a bison, which had apparently been broken to extract the marrow.

The covering was evidently an aqueous deposit, the sedimentary lines being perfect and unbroken. Deposited with and above the shells are gravel and sand, the material becoming finer toward the top, the last foot being fine alluvium and vegetable mould.

The section has been visited by many members of the Academy, and by Prof. Alexander Winchell, while some of the bones were in place, and all agree that the covering of this pre-historic man was a sedimentary deposit. It is believed that further investigation will accumulate many evidences that man was cotemporaneous with this ancient shell-bed.

This paper gave rise to considerable discussion as to the origin of the shell-beds found so commonly in this vicinity.

*This exploration was made in the fall of 1871, and the remains were then presented to the Academy.

Some members suggested that they were formed by human agency, while others contended that they could only have been deposited by the action of water.

Mr. Pratt exhibited a wrought bone implement, which appeared to have been used as an awl, and which he found in the shell-bed near East Davenport.

Mr. French gave a description of some "steaming springs," in the vicinity of Delhi. They are situated in a stone quarry, and send forth occasional puffs of steam. This steam is not visible, however, except in cold weather. The quarry is frequented by rattlesnakes and wolves, and the water abounds with fish. He also spoke of a cave near Decorah, the walls of which were covered with ice in summer.

Dr. Parry and Mr. Putnam mentioned an old deserted mining tunnel, about two miles west of, and on a level with, Empire City, Colorado, (8,500 feet above the sea,) in the mouth of which on the last of August, they found a snow drift, just beyond which the tunnel was nearly closed by a large number of icicles, some of them as large as the leg of a stout man. The ground was frozen, and the timbers covered with a beautiful frost work, for a distance of about fifty feet; beyond which it became warmer and pools of water collected in the bottom. The tunnel is made in a slope of talus which had evidently fallen from above, and was on the north side of Lincoln Mountain, shaded from all, but the morning sun. After some further discussion about "ice caves," and hot springs, Dr. Parry exhibited some bunches of fibres which he obtained while in San Domingo. They were from a plant nearly related to the Century Plant. He said that it made the strongest rope known. He also exhibited a piece of rope made from these fibres.

MARCH 28TH, 1873.—REGULAR MEETING.

President Parry in the chair.

Six members present.

Dr. Parry of the joint committee on building, said that

several plans would be submitted to a meeting of the various societies to be held to-morrow evening, and invited all the members to be present. Mr. Lynch of the same committee, exhibited a plan for a building, which he had caused to be drawn.

Mr. Jas. M. DeArmond was elected a regular member.

It was moved that a committee be appointed to make a proposition to the School Board, that, if the Board would furnish a case, the Academy, or its members, would fill it with specimens, illustrating the various departments of Natural History.

The motion was sustained by remarks by several of the members present, and Messrs. Tiffany and Riepe were appointed as such committee.

Dr. Parry read the following:

Obituary Notice of Prof. John Torrey, M. D.

BY DR. C. C. PARRY.

Since the last regular meeting of this Academy, the brief list of its honorary members has been made vacant by death. Prof. JOHN TORREY, of Columbia College, departed this life March 10th, 1873, in the 77th year of his age. Full of years and honors, a good and wise man has gone to his reward, leaving behind the fruit of much valuable scientific labor well performed, and the rich legacy of a noble example. It is fitting that one who has known him well for the past twenty-eight years,—first in the position of instructor, and always in the character of a warm and sympathizing friend,—should express something, however imperfectly, of the worth and works of him whose finished career, extending through a long and active life, has been intimately identified with the wonderful progress of science during the present century.

Dr. Torrey was born, educated, and spent the greater part of his life in the city of New York. In the year 1817, he prepared for publication his first botanical paper, entitled "*A List of Plants Growing within Thirty miles of New York city.*" This publication, still extant as an historical curiosity, was not printed till the year 1819. Its allusion to old botanizing localities, long since swallowed up in the vortex of this great metropolis, are very suggestive; such as "Bog-meadows near Greenwich;" "Sandy fields about Canal street," and others, now overgrown with brick and mortar.

In the year 1818, then in his 22d year, Dr. Torrey graduated in medicine at the College of Physicians and Surgeons, in which still

flourishing institution he afterwards held the Professorship of Chemistry and Botany up to the year 1855. In the year 1820, he was solicited to join the exploring expedition of Major Long to the Rocky Mountains, but on account of other engagements he was induced to decline in favor of Dr. Edwin James, the subsequent historian and botanist of this pioneer exploration, who died, a few years since, at his home, near Burlington, in this State. Although Dr. Torrey was not officially connected with this celebrated expedition, he was largely identified with its scientific work as co-laborer in describing the new plants then collected from that remote and hitherto unexplored district. These results were published in a series of papers contributed to the Annals of the New York Lyceum, extending over the period from 1823 to 1827. Succeeding these early publications, Dr. Torrey has continued his interest in the development of the Flora of the great West unabated up to the time of his death, covering a period of fully fifty years. His own Herbarium, now in the possession of Columbia College, was constantly enriched with collections brought back by the various government expeditions,—whose published and largely illustrated botanical reports were, in a great measure, gratuitously worked up by this accomplished American botanist. It is with a painful interest that the writer calls to mind that his last living interview with this veteran botanist was as late as September last, when it was my privilege to entertain this distinguished guest at my rude botanical retreat, in the heart of the Rocky Mountains. Here, in close proximity to my cabin, I could point out to him many of the living plants that he had described fifty years previously, from herbarium specimens, but had never before seen in their living beauty.

In my first botanical explorations of the Rocky Mountain region of Colorado, in 1861, I applied the name of "Torrey and Gray" to two twin peaks, which from a distant view had often attracted my attention. In the year following I succeeded in reaching the summit of the eastern peak, now well known as Gray's Peak, and determined its elevation by barometric observation. Ten years afterwards, in 1872, I stood for the second time on the same elevation, accompanied by Prof. Gray himself, and a large party of acquaintances. In response to some appropriate resolutions on this occasion, Prof. Gray, pointing to the closely adjoining western peak, expressed the earnest wish, seconded by all present, that it should continue to bear the name first affixed — of *Mt. Torrey* — in worthy commemoration of his early and valued scientific associate.

Scarcely a month later Dr. Torrey, on his return from California, visited the same locality, but was prevented from making the ascent of the higher peaks by the early severity of the season; from a near view, however, he was permitted to gaze upon the sky-piercing summits, and snatch from their wintry slopes some late grown floral mementos of his early labors, while the retiring western sun crowned with its halo the hoary summit of Mount Torrey.

But, to come back from this interesting digression, it is proper to remark that Dr. Torrey, though more extensively known as a botanist, was also a chemist of no mean attainments. In fact, the greater part of his active professional life was spent either in teaching chemistry to medical or college students, or in superintending its practical details as Government Assayer in New York city, which latter position he worthily filled for 20 years, up to the time of his decease. In 1824, Dr. Torrey was appointed Professor of Chemistry, Geology, and Mineralogy in the Military Academy at West Point, which position he resigned to accept the Chair of Chemistry and Botany in the College of Physicians and Surgeons in New York. It was during his West Point career that he held the position of instructor to many since distinguished in military life. It was not an uncommon circumstance for venerable gray-headed men to address this veteran teacher, in a jocular way, in alluding to his early position as their instructor, in response to which the good Doctor, who never grew old in his feelings, would generally remark, in an under tone, "Pray, don't mention it; it will make me *feel so old*." His acquaintance with all the early botanists of this country was extensive and intimate; his conversation was replete with interesting reminiscences of these old associates, including the names so well known in botanical literature as Nuttall, Muhlenberg, Raffinesque, Mitchell, Baldwin, Elliott, etc., etc. In 1838 he was associated with his early pupil and life-long friend, Professor Gray, in the publication of the "North American Flora," a work still incomplete. But the rich material since accumulated, and now in the hands of Prof. Gray, encourages botanists to hope for its completion by the distinguished junior associate, on whom the weight of sixty-two years still bears lightly.

In December, 1867, a festival was held in New York city, to celebrate the fiftieth anniversary of the first botanical publication of Dr. Torrey. Among the invited guests then present were many who had received their earliest instruction and constant friendly assistance from their distinguished friend in whose honor they had assembled. Prof. Thurber, who presided on this occasion, in his opening address, after alluding to the valuable contributions to science during the intervening fifty years by their honored guest, expressed thus truthfully the feelings of all present, in the remark: "Every one who has been brought into frequent communication with him, knows that he has forgotten the philosopher in the friend, and that he has been made not only a better botanist but a better man."

Farther on in his address, Prof. Thurber, in alluding to that elegant genus of plants that commemorates Dr. Torrey, viz.: the *Torreya* of Florida and California (of which the assembled guests had each a sprig in his button-hole), expressed the wish that the original describer of the first discovered species (Prof. Arnott) had not applied to it the appropriate specific name of *semper virens* (always flourishing) "for,"

he said, turning to Dr. Torrey, "does not he whose name it bears disregard the frosts of time? Does not his presence always bring genial summer, and show us that years make no winter in the heart which has not lost the freshness of youth, but in which love to man and to God reigns supreme? Long after the flowers shall have bloomed above us all, future botanists will carry on the work he has so nobly helped. Those yet unborn will wander by the Southern rivers, visit the mountains of far off Japan, or climb our own grand Sierra Nevada, in search of the *Torrey*, and his name will be remembered as long as there shall be botany and botanists."

With these fitting words, now remembered in sadness, may we not properly close this record of a worthy life spent—but not lost—in the cause of science and truth?

After reading the above, Dr. Parry exhibited a photograph of Dr. Torrey, the last letter he had received from him, and a branch of the plant which has been named after him, *Torrey* *Californica*, (the California Nutmeg.) He also exhibited a piece of maple wood, which showed the effects of a hail storm that occurred in this county, on June 3d, 1868. Five annual rings had grown over the bruised bark, thus forming a complete record of the storm. Also a curious boomerang made and used by the Moquis Pueblo Indians, of New Mexico and Arizona.

Mr. Tiffany exhibited some curious rock formations, which he had taken from the "roofing" of a coal mine near Atkinson, Henry county, Illinois.

MARCH 29TH, 1873.—SPECIAL MEETING.

A meeting of the Library Association was held this evening, at which the Horticultural Society and Academy of Natural Sciences were present. The object of the meeting was to consider various projects for a building. Three plans were brought before the meeting. 1st. A building to cost about \$25,000. 2d. A plain, but substantial building to cost \$8,000 or \$10,000. 3d. The purchase of the Fifth Street Methodist church property, for \$6,000. On an informal vote, a majority of those present expressed themselves in favor of the *third* of the above propositions.

APRIL 12TH, 1873.—SPECIAL MEETING.

Held in Library Rooms.

Vice-President Hazen in the chair.

Mr. Lynch reported that the joint committee on building had decided to recommend to the societies the purchase of the Fifth Street Methodist church property, and that certain alterations be made in it as per plan.

On motion, the report was adopted, and the committee continued, with power to solicit subscriptions, and to negotiate for the purchase of the property. Mr. Lynch stated that Dr. Parry had left the city for the summer, and therefore moved that Mr. W. F. Ross be added to the committee of conference, which was done.

APRIL 25TH, 1873.—REGULAR MEETING.

Held at the office of Putnam & Rogers.

Vice-President Hazen in the chair.

Seven members present.

Mr. Riepe, of the committee appointed to confer with the School Board, reported that the Board had accepted the proposition of the Academy, and would put up a suitable case in the High School for the reception of specimens illustrating the various departments of Natural History.

It was voted that the proposition made by Dr. Parry, at last meeting, to "Amend Article IV. of the Constitution, by substituting *one hundred dollars*, in place of *two hundred dollars*, as the fee required for Life Membership," be adopted.

Major Andrews, W. C. Brewster, R. W. Roberts and Max Marix, were elected regular members.

Mr. French presented the following resolution, which was adopted:

Resolved, That any member contributing the sum of one hundred dollars or more towards the purchase of the Methodist Church building, shall be entitled to a certificate of Life Membership in this association.

Mr. C. E. Putnam was appointed to prepare suitable

resolutions of respect to the memory of Mr. D. S. True, late one of the Trustees of this Academy.

The subject of Ancient Mounds was then discussed. Mr. French spoke of a large group of mounds near Albany, Ill., about thirty miles above Davenport, opposite Camanche. Twenty years ago one of them was opened, and copper knives, and a curiously wrought vase were found in it, together with human remains. These relics were long held by the inhabitants, but have disappeared one by one.

It was proposed by some of the members to form a party for the purpose of exploring these mounds. The mounds between Rock Island and Rock River, were also spoken of. These are evidently of much more recent date than those at Albany.

MAY 2D, 1873.—ADJOURNED MEETING.

Held in the office of Putnam & Rogers.

Vice-President Hazen in the chair.

Six members present.

Mr. Lynch of the committee on building, reported that they had held no meeting since the last report. Several subscription papers had been circulated, but as yet with little success.

Mr. Chas. E. Putnam of the committee appointed to prepare resolutions in respect to the death of Mr. D. S. True, reported the following, which were unanimously adopted:

The members of the ACADEMY OF NATURAL SCIENCES, of which the late David S. True was a member and Trustee, desiring to place upon record some expression of their appreciation of his virtues, and sorrow at his loss, do resolve:

1st. That, in the earnest and eloquent words of affection and grief from his brother members of the Bar, we find only a fitting tribute to his ability and worth, as lawyer and citizen; and we, who have met him in his hours of relaxation, in the serene walks of literature and science, most heartily concur with the sentiments of those resolutions.

2d. That, while it may be true that our friend leaves behind him no great work to perpetuate his memory still one has not lived in vain, who, with varied accomplishments and great capabilities, leaves



the example of a career so modest, so gentle, so full of kindly deeds, and generous impulses; and in days to come, the story of his life will be recounted as of a pure and great lawyer, who, amid the contentions of his profession, never forgot his manhood nor his courtesy; and the influence of that life will remain to elevate the profession he loved, and to illustrate that, in its fair and honorable practice, there will be opened all the avenues of wealth and fame.

3d. That, such was our brother's singular unobtrusiveness, and dislike of notoriety, that he carefully avoided all occasion for public display, and only those to whom was afforded the inestimable privilege of meeting him in familiar intercourse, could form any adequate conception how well-rounded was his character, and how thoroughly developed and cultured his mind; that it was one of his most beautiful characteristics, that he never obtruded his own profession, or interests, or personality; but with men of action, of literature, or of science, made *their* pursuits his topic of conversation; and many of us will remember with delight how patiently he would listen to our imperfect statements of facts in science; with what facility and felicity he would gather and group these truths,—estimate their true value and then return them to us, arranged and transformed in his own singularly clear and concise statement.

4th. That, though making no pretensions to any exact or special culture in science, our brother had acquired an intelligent familiarity with most of its departments, and was a careful and reverent observer of the great works of nature; that in his large and liberal estimate of life and things, shams and traditions could have no part, but all were brought to the severe test of real value; that his clear intellect and strong character carried him easily beyond the trammels of sect and limitation of creed, into the fair domain of pure truth; and that he illustrated, in his life, that it is of less importance what a man professes or believes, than what he does and is; and in his death, our brother leaves behind, to his profession, and the community, the priceless example of a pure and almost perfect life.

5th. That these resolutions be entered on the record of the Society, and a copy of them transmitted to the widow of our deceased friend, as a slight expression of our sympathy in her great affliction.

Mr. Putnam then presented the following paper:
CATALOGUE OF THE COLEOPTERA COLLECTED IN COLORADO IN 1872, by J. D. Putnam.

MAY 30TH, 1873.—REGULAR MEETING.

Held in the office of Dr. Hazen.

Vice-President Hazen in the chair.

The Academy proceeded to ballot for a Trustee, to fill

the vacancy caused by the death of Mr. David S. True, and Mr. George H. French was unanimously elected.

Mr. Chas. P. Burr was elected a regular member.

There was some discussion regarding a trip to Albany, Illinois, to examine the mounds there.

JULY 25TH, 1873.—REGULAR MEETING.

Held in the office of Mr. L. T. Eads, our new rooms not being furnished.

Vice-President Hazen in the chair.

Five members present.

Mr. Tiffany of the committee on rooms, reported that the room back of Mr. Eads' office had been rented to April 1st, 1874, at \$6 per month, and the Academy had taken possession on the middle of July, and the cases and specimens from the Library room had been moved in.

After some discussion regarding the exploration of the ancient mounds at Albany, Illinois, Dr. Iles moved that the Academy recommend to the Board of Trustees, the appointment of some member of the Academy to go to Albany to examine and make measurements, drawing and description of the mounds, and to make such preliminary arrangements as may be necessary there for an excursion and "field meeting," and that the Academy pay the expenses of the person sent. The motion prevailed, and Mr. Pratt was appointed to the work.

AUGUST 29TH, 1873.—REGULAR MEETING.

Vice-President Hazen in the chair.

Nine members present. A number of visitors also in attendance.

Mr. Pratt presented a report upon the ancient mounds at Albany, Illinois, their number, position, structure and contents; illustrated by black-board diagrams. He also presented a number of skulls and other bones, etc., which he obtained from one of the mounds. [See Appendix.]

On motion, it was

Resolved, That the Academy tender the Hon. James Thorington, U. S. Consul at Aspinwall, a vote of thanks for his handsome donation of tropical birds.

On motion, Messrs. Geo. H. French, E. H. Hazen and W. H. Pratt, were appointed a committee to make arrangements for an excursion to Albany, Illinois, and to report at the next regular meeting, or at a meeting to be called at the discretion of the committee.

SEPTEMBER 26TH, 1873.—REGULAR MEETING.

Vice-President Hazen in the chair.

Five members present.

Albert Stibolt was elected a member of the Academy.

Dr. Hazen exhibited a few of the birds which had been mounted.

Dr. Hazen of the committee on an excursion to Albany, reported progress in making arrangements.

OCTOBER 31ST, 1873.—REGULAR MEETING.

President Parry in the chair.

Ten members present.

Dr. Hazen of the committee on an excursion to the mounds, at Albany, Illinois, reported that they had set November 1st, for the day, but the weather having become so severe, they deemed it best to postpone the trip for one week, or more if necessary.

Mr. Pratt reported the receipt of a letter from the Smithsonian Institution requesting a description of the mounds at Albany, together with specimens therefrom.

Mr. Churchill stated that he had visited the mounds at Albany, and made some additional excavations in the same mound, which had been previously opened by Mr. Pratt, as he did not have time to open a new one. He obtained, however, two more skulls entire, with lower jaw, one being that of a child. He also obtained fragments of two more skulls, and a number of other bones.

Col. Wm. Allen, Dr. C. H. Preston and U. N. Roberts, were elected regular members.

SATURDAY, NOVEMBER 8TH, 1873.—EXCURSION TO ALBANY.

To-day a small number of members and friends met at the depot of the Western Union R. R., in Rock Island, and took the train northward. An hour and a half was pleasantly spent discussing archæological topics, before the train stopped among the mounds, about one mile south of Albany, Ill. Here it was found that the party consisted of twenty-three persons. The day was bright and beautiful, just cool enough to make the work pleasant. Mr. Tiffany having preceded the party, had, with the aid of some laborers, done the heavier digging in several mounds, and the gentlemen of the party set immediately to work to make a thorough exploration of these mounds, and before it was time to return the contents of three of them had been carefully examined, and many interesting things found. For an account of these, see Mr. Tiffany's report further on. About 4 o'clock P. M., the southern bound train stopped long enough to take the party on—and the thirty miles to Rock Island were soon passed over. The officers of the W. U. R. R., were very kind and accommodating, and the day was thoroughly enjoyed by all who were fortunate enough to be among the party.

NOVEMBER 28TH, 1873.—REGULAR MEETING.

Vice-President Hazen in the chair.

Seven members present.

Dr. E. H. Hazen presented a Report on the Excursion to Albany, on November 8th.

Mr. A. S. Tiffany then read his Report on the Mounds recently explored at Albany. [See Appendix.]

Capt. L. M. Haverstick was elected a regular member.

Messrs. Pratt and Tiffany were appointed a committee to make selections from the ethnological specimens collected at Albany, for the Smithsonian Institution.

DECEMBER 26TH, 1873.—REGULAR MEETING.

President Parry in the chair.

Eleven members present.

Mr. Tiffany of the Trustees' committee on rooms, stated that very good, well lighted rooms could be had in the Odd Fellow's Building. He also stated that Dr. Parry had offered as much room as the Academy might desire, on the second floor of his building, corner of Front and Perry streets, for two years, free of rent, if the Academy would fix it up.

Mr. Pratt exhibited a photograph of one of the skulls, from the Albany Mounds, proposing to have them all photographed.

The Recording Secretary read a letter received from Prof. Baird, in regard to the publication of the proceedings of the Academy, in the *New York Tribune*.

Dr. Parry presented the following resolution, which was unanimously adopted:

Resolved, That in the recent decease of Prof. Louis Agassiz, society and the civilized world at large, mourns the loss of one eminently gifted in all that adorns the highest type of manhood; a genial gentleman in the walks of private and professional life, an earnest advocate for an advanced standard of modern education, and who, far beyond all others of this age, in popularizing science, never lowered its just demands, while illustrating in his own life and labors, the necessity of prosecuting scientific research, irrespective of pecuniary gain, and with a supreme regard to the permanent claims of truth.

Col. Allen stated that he had recently caught in a steel trap, set for rabbits, near his residence, (near Rockingham,) an animal which he supposed to be an ermine. He had also captured five or six skunks very lately. These animals, which were formerly quite rare hereabouts, seem to have increased with the settlement of the country.

Some discussion was held on the subject of revising the Constitution and By-Laws, so as to place the Academy on a more useful basis.

On motion, the President and Recording Secretary were appointed a committee to make a revision of the Constitution, and to report as soon as practicable.

Mr. Ross spoke of the advantage of holding weekly meetings, of a more social nature than the regular monthly meetings, and to which ladies should be invited. This plan met with very general favor from the members present, some of whom had previously attended similar meetings.

On motion, it was decided to hold a "Conversazione," on the second Friday in January, Dr. Hazen offering his office for that purpose, and Mr. Ross was appointed to prepare rules for the meetings.

The President stated that the Annual Meeting would be held on the evening of Wednesday, Jan. 7th, 1874, in the office of Putnam & Rogers. He hoped to see as many of the members as possible present.

JANUARY 7TH, 1874.—ANNUAL MEETING.

President Parry in the chair.

Fourteen members present.

Mr. Tiffany, Treasurer, presented a report of Finances, showing:

Balance on hand.....	\$58.95
Due from former Treasurer.....	76.02
	<hr/>
	\$134.97

On motion, the chair appointed Messrs. E. P. Lynch and W. H. Pratt, as auditing committee, to whom the Treasurer's report was referred.

The President presented a report on the progress and condition of the Society.

The Academy then proceeded to the election of officers, which resulted as follows:

President—DR. C. C. PARRY.

Vice-President—DR. E. H. HAZEN.

Corresponding-Secretary—W. H. PRATT.

Recording-Secretary—J. D. PUTNAM.

Mr. Churchill exhibited some very fine and interesting specimens of calc spar, containing long acicular crystals of some mineral extending across the spaces.

Dr. Farquharson read a short report of analysis and measurement of a number of the crania and long bones recently exhumed from the Albany mounds.

On motion, a vote of thanks was tendered to Messrs. Putnam & Rogers, for use of room for meeting.

JANUARY 9TH, 1874.—CONVERSAZIONE.

Held in Dr. Hazen's office.

Thirty-five members present.

The subject for discussion—Evolution.

JANUARY 16TH, 1874.—CONVERSAZIONE.

Held in Dr. Hazen's office.

The subject for discussion—Life.

JANUARY 30TH, 1874.—REGULAR MEETING.

President Parry in the chair.

Nine members present.

Prof. J. S. Newberry, of Columbia College, N. Y., was elected a corresponding member of the Academy, and Mr. George S. Heywood, a regular member.

Mr. Tiffany presented the matter of negotiations, which have been commenced for the purchase of a scientific library, which is offered to the Academy by Prof. W. H. Barris, and on motion, Messrs. Tiffany, Hazen and Farquharson were appointed a committee to determine the feasibility of purchasing the books by private subscription and if deemed advisable, to procure subscriptions and consummate the arrangement.

Dr. Farquharson made some remarks upon the peculiar cranial and other characteristics of the pre-historic races of America and Europe, and showing quite conclusively that the remains procured from the mounds at Albany, Ill., are those of the genuine "Mound-Builders."

The committee on Photographs, exhibited a series of seventeen prints, being different views of seven different skulls, from Albany, and reported that the photographs

were nearly ready for distribution, in exchanges with other societies, and also for sale.

FEBRUARY 6TH, 1874.—CONVERSAZIONE.

Meeting held in the office of Dr. Hazen.

Subject—"The best method of Governing."

FEBRUARY 16TH, 1874.—CONVERSAZIONE.

Meeting held in the office of Dr. Hazen.

Subject for discussion—Rights of Minorities.

FEBRUARY 24TH, 1874.—CONVERSAZIONE.

Held in Dr. Hazen's office.

Subject for discussion—"Wherein do the Rights of Women differ from those of Men."

FEBRUARY 28TH, 1874.—REGULAR MEETING.

President Parry in the chair.

Six members present.

Dr. Hazen reported the donation, by I. W. Harrison, Esq., of a freak of nature, in the form of a specimen of spontaneous grafting, being a section of the body of an oak tree, having a limb, which, about a foot above its insertion, is grafted into the body of the tree, entirely enclosed and overgrown by the solid wood.

Dr. Farquharson of committee on purchase of books from Prof. Barris, reported that the required amount, \$300, was nearly made up, wanting only \$17, and that \$100 had been collected and paid over.

Mr. Pratt reported that the committee on report to Smithsonian Institution on exploration of Albany mounds, had sent a report, and also sent three of the skulls, Nos. 4, 5 and 6, and some other bones, and a set of the photographs, of seven skulls, consisting of seventeen prints. A set of photographs had also been sent to the Boston Society of Natural History.

He also stated that sets of photographs were now ready for sale.

Dr. Parry called attention to the collection of plants, some two thousand species, donated to the Academy some time since, by Judge G. W. Clinton, President of the Buffalo, (N. Y.) Society of Natural Sciences. He stated that he had arranged the plants for convenient reference, that he found them in good condition, correctly labeled, and that they form a valuable collection, comprising about one-half of the plants contained in Gray's Botany of the United States.

On motion, it was voted that the Academy send to the Buffalo Society a set of the photographs of skulls from the Albany mounds, and a copy of the report on the same.

Mr. Lodwig Davies and Dr. W. D. Middleton were elected regular members of the Academy.

Mr. Pratt exhibited, as a curiosity, a specimen of writing by a little girl, five years of age, a member of the public schools. It is written in a reverse or negative form, so as to read correctly by reflection in a looking-glass. It is remarkably well written, with the right hand, but running from right to left. She does this without instruction in that way, taking it from the regular blackboard exercises presented by the teacher, changing it by some process of mental inversion, which would probably puzzle Mr. Darwin himself to account for, and she seems able to see the copy in no other way.

Dr. Farquharson made some remarks upon the post-mortem examination of the Siamese Twins, describing the anatomical structure of the bond by which they were connected.

MARCH 27TH, 1874.—REGULAR MEETING.

Mr. A. U. Barler in the chair.

Six members present.

Mr. Tiffany made the following remarks concerning

An Ancient Copper Implement Donated by E. B. Baldwin.

This implement was found in excavating for the new gasometer in the summer of 1872, four hundred feet north of the Mississippi at low water, and eleven feet below the surface, lying in a small groove or fissure in the Devonian rocks.

I have examined a section of nine and a half feet of strata on the lot adjoining on the north, and find two feet of black soil, five feet of brown clay mixed with sand, and two and a half feet of pebbles and small boulders, with clay and sand, and did not reach the rock at that depth. The pebbles and boulders are partly of primitive rock, some of the larger ones are fragments of the Devonian limestone which underlies the whole city.

The surface of the earth at that place is nineteen and a half feet above low water mark, and if the earth were stripped off, high water in the Mississippi would cover the rock where the implement was found to the depth of eight feet.

The implement is of native copper, shaped by hammering. It is four and three-fourths inches in length, diameter one-fourth of an inch, but considerably reduced by oxidation; it is pointed at both ends, tapering gradually from the middle each way.

The Secretary read some correspondence in reference to the photographs of crania, and stated that a set had been sent to Dr. Jeffries Wyman, curator of the Peabody Museum of Ethnology, Cambridge, Mass.

Mr. Tiffany of committee on rooms, reported that the committee had engaged the front room in Odd Fellows' Block, at seventy-five dollars a year, commencing April 1st, 1874.

W. M. Potter was elected a regular member of the Academy.

APRIL 7TH, 1874.—CONVERSAZIONE.

Held at Dr. Hazen's office.

APRIL 14TH, 1874.—CONVERSAZIONE.

Subject for discussion—Force.

Small attendance, but interesting discussion.

APRIL 21ST, 1874.—CONVERSAZIONE.

Subject for discussion—Animal Magnetism.

Good attendance, and lively discussion.

APRIL 24TH, 1874.—REGULAR MEETING.

Held in the new room in Odd Fellows' Building.

Vice-President Hazen in the chair.

Seven members present.

The committee on books reported that the books purchased of Prof. Barris had been paid for, and were on the table for inspection, but the business of collection, &c., was not quite completed, and a book case is needed for immediate use.

The Corresponding Secretary read a letter from Mrs. Mary P. Haines, concerning a package of fossils she had sent.

Also a letter from Prof. F. A. P. Barnard, President of Columbia College, in reply to a letter of inquiry concerning the Metrological Society, of which Prof. B. is also President, with Constitution, &c. enclosed; also memorials to Congress, which he wishes us to circulate for signatures, and expressing the hope that the Academy will take an active interest in the matter for which the Society is organized, viz: the introduction to general use of the decimal system of weights and measures.

On motion, it was voted that the thanks of the Academy be tendered to Dr. Farquharson, for his very valuable donation of seven volumes of Proceedings of Philadelphia Academy of Natural Sciences, 1867-1873, and also to Mr. J. D. Putnam, for books presented by him.

APRIL 28TH, 1874.—CONVERSAZIONE.

Held in the new room.

Dr. Hazen in the chair.

Forty persons present.

Subject for discussion—Animal Magnetism, continued.

MAY 5TH, 1874.—CONVERSAZIONE.

Held at the Academy rooms.

Vice-President in the chair.

Forty-five persons present.

Subject for discussion—The Senses. Lively discussion.

MAY 12TH, 1874.—CONVERSAZIONE.

At Academy rooms.

Vice-President Hazen in the chair.

Eighteen persons present.

Subject for discussion—Instinct, its relation to brain and mind, and its susceptibility of improvement.

Dr. Preston and Mr. R. W. Roberts were appointed a committee on newspaper notices.

MAY 19TH, 1874.—CONVERSAZIONE.

At the Academy rooms.

Vice-President Hazen in the chair.

Twenty-five persons present.

Subject for discussion—The Moral Conscience. An animated and interesting discussion.

MAY 26TH, 1874.—CONVERSAZIONE.

Vice-President Hazen in the chair.

Eighteen persons present.

Subject for discussion—Compulsory Education.

MAY 29TH, 1874.—REGULAR MEETING.

Vice-President Hazen in the chair.

Nine members present.

The committee on Metrology reported letters from Prof. Sam'l. D. Tillman, Corresponding Secretary of the Metrological Society, and from Prof. Hinrichs, of Iowa City, concerning cheap standard weights and measures for introduction into schools.

The committee on revision of Constitution and By-Laws, Dr. C. C. Parry and Mr. J. D. Putnam, both being absent from the city, presented their report through Dr. Hazen; comprising an entire revision of Constitution and By-Laws, which was read and laid over for action at next regular meeting.

Rev. S. S. Hunting, Joseph A. Crawford and W. A.

Lynch, were elected regular members of the Academy, and Mrs. Mary P. Haines of Richmond, Indiana, was elected a corresponding member.

JUNE 9TH, 1874.—ADJOURNED MEETING.

Vice-President Hazen in the chair.

Ten members present.

Dr. Farquharson read a paper upon the Metric System of Weights and Measures; its history and its advantages, and advocating its gradual adoption, to take the place of the old system in common use. A general discussion followed.

On motion, it was voted that the thanks of the Society are due to the Doctor for his able exposition of the subject.

JUNE 16TH, 1874.—CONVERSAZIONE.

Vice-President Hazen in the chair.

Twenty-three persons present.

Subject for discussion—Heredity. Opened by Dr. C. H. Preston. Had a lively discussion.

JUNE 23D, 1874.—CONVERSAZIONE.

Vice-President Hazen in the chair.

A good attendance.

Subject for discussion—Culture in relation to Heredity.

Conversazione adjourned for the summer vacation, to meet again Sept. 8

SEPTEMBER 8TH, 1874.—CONVERSAZIONE.

Vice-President Hazen in the chair.

Twenty-six persons present.

Subject for discussion—Language.

SEPTEMBER 15TH, 1874.—CONVERSAZIONE.

Vice-President Hazen in the chair.

Nineteen persons present.

Subject for discussion—Force.

SEPTEMBER 22D, 1874.—CONVERSAZIONE.

Dr. Preston in the chair.

Twenty-three persons in attendance.

Subject for discussion—The Imagination.

SEPTEMBER 29TH, 1874.—CONVERSAZIONE.

Dr. Hazen presided.

Twenty-four persons present.

Subject for discussion—Communism.

SEPTEMBER 25TH, 1874.—REGULAR MEETING.

Mr. C. E. Putnam occupied the chair.

Eleven members present.

The revised Constitution and By-Laws presented at last meeting were read, and with slight modification in the minor details, were unanimously adopted, to take effect from and after the annual meeting of January, 1875.

SEPTEMBER 29TH, 1874.—SPECIAL MEETING.

Vice-President Hazen in the chair.

Eight members present.

It was stated that the special object of the meeting was to consider the request of the Library Association, that the Academy appoint a committee to confer with a committee already appointed by that Association, regarding the occupancy of the Library rooms, by the Academy.

On motion, a committee of three, Dr. E. H. Hazen, Mr. R. W. Roberts and Dr. C. H. Preston, were appointed for the above purpose, and instructed to report at the next regular meeting.

On motion, it was voted that the Davenport Woman Suffrage Association be allowed the use of the Academy room for meetings, once a week, by defraying the additional expense incurred thereby for fuel and lights.

OCTOBER 30TH, 1874.—REGULAR MEETING.

President Parry in the chair.

Five members present.

Messrs. J. H. Berryhill, Franklin Kirk, Rishah Buffum, J. J. Nagel and J. R. Bowman, were elected regular members of the Academy.

NOVEMBER 27TH, 1874.—REGULAR MEETING.

President Parry in the chair.

Twelve members present.

Dr. Hazen, chairman of committee of conference on rooms in Library Building, reported that the Library room had been divided, and no steps had been taken toward arranging for joint occupancy.

On motion, the report was accepted and the committee discharged.

Messrs. J. G. Haupt and M. Sands were elected regular members of the Academy.

Mr. A. S. Tiffany mentioned that he had spent several days, lately, searching for mounds, above and below the city, on both sides of the river. He spoke particularly of one which he called a

Pre-historic Cremation Furnace,

Situated on the farm of Mr. J. Staffelbach, seven miles below the city, and three-eighths of a mile from the river, which he had recently explored, in company with S. P. Stevens, Esq.

The mound explored was upon the crest of a spur bearing a little south of west from the main bluff, which here forms a prominent projecting point, known to river pilots as Eagle Point. The mound was about twenty-five feet in length, and two feet high, although from its peculiar position upon the very narrow and sloping ridge, its dimensions were difficult to determine.

The surface was of the usual black soil to the depth of from six to twelve inches. Next was found a burnt indurated clay, resembling in color and texture a medium burned brick, and about thirty inches in depth. Immediately beneath this clay was a bed of charred human remains six to eighteen inches thick. This rested upon the unchanged and undisturbed loess of the bluffs, which formed the floor of the pit. Imbedded in this floor of unburned clay were a few, very much decomposed, but unburned human bones. No implements of any kind were discovered.

The furnace appears to have been constructed by excavating the pit and placing at the bottom of it the bodies or skeletons, which had

possibly been collected from scaffolds, and placing the fuel among and above the bodies, with a covering of poles or split timbers extending over and resting upon the earth, with the clay covering above, which latter we now find resting upon the charred remains. The ends of the timber covering, where they were protected by the earth above and below, were reduced to charcoal, parallel pieces of which were found at right angles to the length of the mound. No charcoal was found among or near the remains — the combustion there having been complete. The porous and softer portions of the bones were reduced to pulverized bone black.*

This paper gave rise to an animated discussion, several members not concurring with Mr. Tiffany in his idea of a furnace used for cremation. Some thought it more likely to have been used for sacrificial purposes.

DECEMBER 11TH, 1874.—ADJOURNED MEETING.

Vice-President Hazen in the chair.

A communication was read from Dr. C. C. Parry, offering to give a lecture on Utah, for the benefit of the Academy, which offer was accepted.

The committee on lecture by Mr. Phillips, (Buckskin Joe,) reported two lectures delivered by him before the Academy, on the "Habits" of some Indian tribes.

DECEMBER 25TH, 1874.—REGULAR MEETING.

President Parry in the chair.

Six members present.

Mr. Henry Spink was elected a regular member.

*Upon further examination of this mound, in the spring of 1875, with the assistance of Mr. Stevens, Mr. Tiffany was enabled to determine more perfectly the construction of the furnace, as previously described, and as illustrated on Plate XXVI. The sections are drawn on a scale of one-eighth of an inch to a foot.

Fig. 2, is a vertical section through the length of the mound.

- a. External covering of black surface soil not burned. 6 inches.
- b. Burnt indurated clay,—30 inches.
- c. Charred human remains,—16 inches.
- d. Undisturbed loess clay rising on all sides.

Fig. 3, is a horizontal section, cutting Fig. 2, x to y.

- a. Burnt clay filling the excavated pit above the charred remains.
- b. b. Outline of this burnt clay.
- c. Earth support around which the draft is supposed to have passed.
- g. Parallel pieces of charcoal, as above mentioned.

There was no indication that the mound had been opened after the burning.

JANUARY 9TH, 1875.—ANNUAL MEETING.

President Parry in the chair.

Nine members present.

The Treasurer, Mr. A. S. Tiffany, presented the following report on finances, for 1874, together with remarks on the wants and work of the Society.

TREASURER'S REPORT.

Balance on hand, Jan. 1st, 1874.....	\$ 58.95
Initiation fees, received.....	45.00
Annual dues ".....	83.00
Special subscriptions.....	374.00
Miscellaneous receipts.....	9.45
Total.....	\$570.40
Current expenses.....	\$100.00
Purchases, books, etc.....	457.20
Balance on hand.....	12.40
	\$570.40

Mr. C. E. Putnam read a revision of the ARTICLES OF INCORPORATION adapted to the new Constitution, and offered the following resolution, which was unanimously adopted:

Resolved, That the amended Articles of Incorporation, of "The Academy of Natural Sciences," prepared and submitted by Mr. Putnam, be approved, and that the officers and Trustees elect be authorized and instructed to duly execute and acknowledge and have the same filed for record as required by law.

The Society then proceeded to the election of officers for 1875, with the following result:

President—DR. E. H. HAZEN.

Vice-President—GEO. H. FRENCH.

Recording-Secretary—DR. C. H. PRESTON.

Corresponding-Secretary—W. H. PRATT.

Treasurer—A. S. TIFFANY.

Librarian—DR. R. J. FARQUHARSON.

Curator—DR. C. C. PARRY.

Trustees— { C. E. PUTNAM,
 JOHN HUME,
 WM. RIEPE.

The retiring President then vacated the chair to his successor, and read the following

ANNUAL ADDRESS.

Gentlemen of the Academy :

In concluding my duties as your presiding officer, during the past year, by a condensed statement of the present condition, and future prospects of the Davenport Academy of Natural Sciences, it is gratifying to state that, although many desirable results are still far from being realized, yet some encouraging progress has been made in the direction toward which our ultimate aims point.

It is during the past year, that an institution similar to ours, and but a few years older, has been endowed by a living benefactor, James Lick, of San Francisco, with ample means for prosecuting its scientific work; and the California Academy of Science will ere long erect its beacon light on the Pacific Coast, to the encouragement and emulation of less favored scientific bodies in the older settled eastern districts. Such *Licks*, (if you will pardon the pun,) our own Academy holds itself in readiness to receive without flinching.

MEMBERSHIP.

The present qualified membership of the Academy now numbers 41. Fifteen resident members have been elected during the year.

FINANCES.

The receipts from all sources during the past year, as itemized in the Treasurer's report, amount to \$506.45. Expenditures during the same period, \$544.10. Available funds on hand, \$30.

LIBRARY AND MUSEUM.

The donations of books to the library, and specimens to the museum have been fully equal to those of the previous years, and are likely to increase in value and amount, quite as fast as the Academy will have the means of safe storage and suitable display. An opportunity for securing a very valuable series of scientific works, has been improved by the purchase of the Barris Library. This has been accomplished by public subscription, amounting to \$358, and is included in the above item of general expenditures. The chief credit of carrying out this enterprise is due to the persistent efforts of our efficient Treasurer, Mr. A. S. Tiffany.

REGULAR MEETINGS.

The average attendance at the regular meetings of the Academy, has been eight, being an increase of one over that of the previous year.

REVISION OF THE CONSTITUTION.

During the past year, in accordance with a suggestion made at the last annual meeting, a revision of the Constitution and By-Laws has been adopted, to go into effect with the election of officers for the en-

suing year. Some legal defects in the original articles of incorporation will also come up for definite action at the present meeting.

SCIENTIFIC WORK.

Ethnological investigations in reference to the pre-historic mound builders of this valley have been continued, with results largely exceeding all previous expectation. It is to be hoped that this Academy, which may be justly regarded as the pioneer in this enterprise, at least in this section of country, may be the depository of all such collections illustrating the life and character of our unknown predecessors, so that eventually these dumb monuments, by persistent questioning of the spade and mattock, may speak to us.

Some botanical observations made in Southern Utah, during the past season, by members of the Academy, are now in course of publication in the *American Naturalist*, the results indicating the discovery of twelve new species of plants, and the re-collection of several others heretofore imperfectly known from single fragmentary specimens.

RECORDING SECRETARY.

Owing to continued ill health, the Recording Secretary, Mr. J. D. Putnam, has been absent during the greater part of the year, but his interest in our scientific work and progress has been manifested by frequent correspondence, and several donations.

ACADEMY ROOMS.

For the first time in the history of the Academy, a suitable room for regular meetings, and display of collections, has been secured. Several desirable additions in the matter of furnishing are still needed to render the apartments attractive to visitors, and convenient for examining collections and consulting works of reference. It is desirable that the museum should be made accessible to the public at certain stated times, and that no needless obstruction be placed in the way of any one desiring such information or instruction as our collection and library can offer.

CONVERSAZIONI.

A series of *Conversazioni*, on popular scientific subjects, has been kept up through the year, under the auspices of the Academy, eliciting a commendable degree of public interest.

FINANCIAL ESTIMATES.

The Treasurer estimates that an amount of not less than \$400 will be needed for carrying on efficiently the work of the Academy for the present year. This sum is considerably in excess of our ordinary sources of revenue, and will require special efforts on our part to meet.

PERMANENT ENDOWMENT.

The very essential matter of permanent endowment is still unprovided for. We have, as yet, no life members, no Peabody, no Lick

endowment. Whether a Micawber-like patience will avail much in that direction, is questionable. An age and country claiming to be progressive, which still largely excludes from the *curriculum* of liberal studies the common branches of Natural Science; which takes pride in erecting and furnishing, at the public expense, magnificent high schools without any provision for a museum of natural history, without a geological case or chart, without a chemical laboratory, apparently content in wide, roomy apartments, with aiming to reach the minds of pupils through the medium of dull abstractions, while staggering under the fearful load of that horrible modern invention, *text-books*, can hardly yet be expected to patronize an Academy of Science on the plan of the Alexandrian School. But nevertheless "the world moves," and dead conservatism must ere long give place to living progress. Those who can least afford to wait are not the poorly rewarded cultivators of science, but the present idle recipients of their bounty.

RESIGNATION.

For an indefinite period, gentlemen, I have, by your courtesy, occupied the position of your presiding officer. As long as its duties were in great measure nominal, and while it seemed desirable that some name associated with scientific pursuits, should head your official list, I could not well decline what I shall always regard as a distinguishing honor. But the time has now fully come when a position like this requires active, efficient executive work, and the honor that follows successful achievement; I therefore respectfully ask the privilege of proving my good will, by being allowed to fall back into the ranks of private members, for which my tastes and inclinations best qualify me. The science to which I am particularly devoted—Botany—though occasionally putting to the test the *climbing* ability of its devotees, is much more largely promoted by *stooping*, in which position I beg leave to make my retiring bow.

Mr. Wm. Davidson, of Boulder Co., Colorado, being present, made some instructive remarks on the subject of Lignite, of which there are extensive deposits in the locality mentioned.

JANUARY 29TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Eight members present.

Messrs. Chas. C. Leslie, S. F. Gilman and F. W. Kelley, were elected regular members of the Academy.

On motion, the President was appointed to confer with a committee from the Clionian Society, on securing Mr. Mills, of Chicago to lecture before the two Societies.

The following resolution presented by Dr. Parry, was adopted:

Resolved, That hereafter, until further notice, the rooms of the Academy shall be open to the public every Saturday afternoon, from two to five o'clock, and that some member to be designated by the President, for each day, who shall be present to keep the room properly heated and make necessary explanations to visitors in attendance.

On motion, the Curator was instructed to have Mr. Kuhnen's donation of the head of a Mountain Sheep properly prepared and mounted.

Dr. C. H. Preston presented a paper on the subject of

STORMS,

With charts illustrative of their laws of propagation; also the following table of temperature, barometric pressure, direction of winds, etc., at eight principal U. S. Signal Service Stations, during the passage from the Rocky mountains to the Atlantic coast, of the recent remarkable COLD WAVE, of January 7th to Jan. 11th, 1875.

The table is, for the sake of definite comparison, compiled from the three daily Signal Service observations made at 7:35 A. M., 4:35, and 11 o'clock P. M., Washington time, or 6:41 A. M., 3:41 and 10:06 P. M., Davenport time. Although at some points the absolute minimum temperature was reached between the hours mentioned. For points to the east of Davenport, only the 11 o'clock P. M. observations, as given in the daily weather maps of the War Department, were obtainable.

STATIONS.	Time of Minimum Temperature.	Barometer.	Thermometer	Var a'n in past 24 hrs.		Direction of Wind.	Veering of Wind during Storm.
				Bar.	Ther.		
Virg'a City	Jan. 7, 10.06 P. M.	29.60	-22	+0.34	-38	E.	N.E. to E. to S.E.
Denver....	" 8, 3.41 P. M.	30.18	-14	+0.52	-58	N.E.	S.W. to W. to N.E.
Omaha....	" 8, 10.06 P. M.	30.86	-15	+0.89	-34	N.W.	S. to N.W.
Davenport	" 9, 6.41 A. M.	30.75	-20	+0.64	-35	W.	E. to S.E. to W.
Chicago...	" 9, 3.41 P. M.	30.55	-15	+0.34	-30	S.W.	S.W. to W. to S.W.
Pittsburg..	" 9, 10.06 P. M.	30.63	-12	+0.65	-34	S.W.	N.W. to E. to S.W.
Boston....	" 10, 10.06 P. M.	30.39	+5	+0.36	-3	W.	N.E. to N.W. to W.
Halifax...	" 11, 10.06 P. M.	30.08	+5	+0.16	-2	W.	E. to N.W. to W.

The actual storm, or area of low barometer, preceding the cold wave, as tabulated above, passed from the Mississippi eastward, accompanied by wide-spread precipitation of snow and rain, on Janu-

ary 8th and 9th. It advanced steadily at the rate of about forty miles an hour, and was followed by a rapid rise in barometric pressure, and a correspondingly rapid fall in temperature. That the storm-center passed to the north of the first six stations, and to the south of New England, is shown by the change in the veering of the wind.

The writer alluded to the recently advanced theory, that cold weather following our winter storms is caused, not by cold air translated from a distance, but by the descent of upper strata in the immediate wake of the storm.

FEBRUARY 2D, 1875.—SPECIAL MEETING.

President Hazen in the chair.

Six members present.

The object of the meeting was to frame resolutions of respect to the memory of our late associate member, R. W. Roberts. Messrs. Hazen, Tiffany and Preston, were appointed a committee for that purpose, and after consultation, reported the following, which were unanimously adopted:

WHEREAS, We are called upon most unexpectedly to mourn the loss of our highly esteemed associate, R. W. Roberts;

Resolved, That in his death the Academy has lost a most faithful and efficient member, and the community an honest, genial and worthy citizen, and that the friends of the deceased have our heartfelt sympathy in their deep affliction.

Resolved, That his friend, W. H. Holmes, be requested to write the biography of the deceased for the archives of the Academy.

Resolved, That a copy of these resolutions be transmitted to the immediate relatives.

FEBRUARY 26TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Nine members present.

Messrs. Jonathan Parker, E. S. Ballord and James B. Mason, were elected regular members.

Dr. Farquharson called the attention of the Academy to a paper read by him before this body, in 1869, advancing the theory that part of the motion of translation of a rifle ball is converted into heat by arrest in the animal body; and proceeded to give an account of recent experi-

ments made in Germany corroborative of this view. [See Appendix.]

The amendment to Article 6th, of the By-Laws, proposed at last meeting, making the number of Trustees necessary for a quorum *six*, instead of *five*, was adopted.

The following resolution was offered by Mr. Tiffany, in memory of the late SIR CHARLES LYELL, and unanimously adopted.

WHEREAS, Sir Charles Lyell, departed this life on the 22d inst.:

Resolved, That we recognize his eminent services to science, in observing and arranging the facts and phenomena presented in the study of the earth's crust, and in giving to the world, what no previous writer had done, a clear and comprehensive system in the study of Geology.

MARCH 26TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Eleven members present.

Dr. C. C. Parry read a communication from the Smithsonian Institution, relative to a collection of specimens of the small animals of the United States, requesting the Society to forward gopher skins, etc., also asking the loan of pipes and copper implements, found in pre-historic grave mounds, near this city, for the purpose of having casts and photographs taken from the same. The matter was referred to the Corresponding Secretary.

On motion, Dr. Farquharson was authorized to have photographs of copper axes taken, additional to those already procured; also casts of stone pipes, and forward sets of each to the Smithsonian Institution.

Dr. Hazen announced a donation of cash, \$70.50; subscriptions, \$20.50, from Mrs. C. E. Putnam and other ladies, collected for the purpose of furnishing the Academy rooms with new cases, carpet, etc. The donation was accepted, with the thanks of the Association, and the ladies making it were invited to assist in its expenditure for the purpose designated.

A donation of the "Contributions to the Natural History of the United States," by Prof. Agassiz, in three volumes, was received from Mr. Rolfe Millar, and the thanks of the Society were returned for the same; also for the State Survey and Geological report of Missouri, with two atlases of Iron Regions; from Mr. Broadhead, State Geologist.

Mr. Tiffany reported informally on mounds discovered on the farm of Mr. Sears, near Milan, and was appointed to negotiate for the privilege of exploring them.

The Academy then proceeded to the special order of the meeting, being the reading of a memoir of the late R. W. Roberts, member of the Academy, by Mr. W. H. Holmes. The paper was listened to with much interest, and referred to the committee on publication.* A vote of thanks was extended to Mr. Holmes.

Messrs. Allibone Morton and J. B. Phelps were elected regular members.

APRIL 9TH, 1875.—ADJOURNED MEETING.

President Hazen in the chair.

Eight members present.

A long list of donations was reported.

The special order of the evening was a paper by Dr. R. J. Farquharson, on "Copper relics and specimens of cloth supposed to have come down to us from a pre-historic people, called the Mound-Builders." [See Appendix.] Some discussion followed as to the probable age of the mounds.

Prof. Pratt reported another mound opened, with the assistance of Capt. Hall, on his land, from which the following articles were obtained for the Academy: A copper axe covered with cloth, a stone pipe, four arrow heads of flint, and one of a stone supposed to be obsidian, with several fragments of the same, a bone implement, a lump of yellow ochre, with flakes of mica adhering, a quantity of

*This memoir was published in full in the Davenport Daily and Weekly Gazette, at the time.

pottery in fragments, and parts of two skeletons, one skull being pretty well preserved.

On motion, the committee on photographs of axes, etc., were authorized to sell sets of the same for the benefit of the Academy.

APRIL 30TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Ten members present.

The committee on museum reported progress in expenditure of the Ladies Furnishing Fund, window blinds and two additional cases having been procured, and the floor covered with matting.

Dr. Farquharson, chairman of committee on photographing, etc., reported photographing and printing done, and a labelled set sent to the "Naturalist," besides six sets sold. The committee were authorized to send sets to as many scientific societies as they might see fit.

The Corresponding Secretary read a communication from the Smithsonian Institution, requesting a collection of local fresh water shells for exhibition at the Philadelphia Centennial, and stated his intention of making and forwarding such a collection on behalf of the Academy.

Messrs. J. C. Bills, C. H. Clemmer, C. J. Powers, and Rolfe Millar, were elected regular members of the Academy.

MAY 28TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Thirteen members present.

Dr. Farquharson of the committee on photographs, reported that a set had been sent to the Peabody Museum. He recommended the purchase of a number of books of reference, and was authorized to procure them.

Messrs. F. A. Balch, F. W. Hancock, Clarence Lindley, J. B. Fisher, Capt. W. P. Hall and Rev. J. Gass, were elected regular members of the Academy.

Messrs. W. F. Ross, W. H. Pratt and J. J. Nagel were appointed a committee to ascertain on what terms additional rooms could be rented from the Odd Fellows' Association.

Messrs. Iles, Tiffany and Mrs. C. E. Putnam, were appointed a committee to confer with Col. Flagler, to obtain the privilege of exploring mounds on the Island.

JUNE 11TH, 1875.—SPECIAL MEETING.

President Hazen in the chair.

Mr. W. H. Pratt read a paper upon

Force and Motion,

Controverting the theory now accepted and taught by physicists generally, viz: that the force of a body in motion, is in proportion to the square of the velocity, and that the force which imparts motion to a body, is in proportion to the square of the acceleration.

With the aid of diagrams and actual experiment, this law of the square was shown to be inconsistent with the accepted laws of motion of falling bodies; of centrifugal force; of pressure of the wind; of resistance to motion in a fluid medium; of pressure of gases; of propulsion of projectiles; of velocities of fluids discharged under pressure; with the law upon which the densities of the planets are computed; with Sir Isaac Newton's universally accepted proof of the law of gravitation by computations upon the moon's motion; and with the *facts* in the case of impact of unequal bodies.

It was shown that each one of these is a clear and distinct proof of the *simple* relation—*force proportional to velocity*.

It was also shown that *vis viva*, or striking force is measurable in terms of weight and time, or of pressure and time, and that the foot pound is not a true measure of force or of work, but is altogether indefinite.

JUNE 25TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Nine members present.

The Librarian reported a number of books received during the last month.

A communication was read from Dr. C. C. Parry, resigning the Curatorship of the Museum, on account of necessary prolonged absence.

On motion, the resignation was accepted and Prof. W. H. Pratt was appointed Curator, *pro tem.* Also a communication from the Smithsonian Institution requesting data of interest in regard to, and a microscopic section of the relic from Albany mounds in shape of bear's tooth. It was voted to comply with the request, and the President was authorized to prepare the section.

Mesdames Dr. C. C. Parry, J. T. Lane, D. S. Sheldon, Dr. E. H. Hazen, John Hume, W. C. Wadsworth, S. S. Hunting, S. B. R. Millar, M. B. Cochrane, C. E. Putnam, Miss Lucy Pratt, Messrs. J. P. Dosh, Geo. H. Spink, S. E. Brown, and L. B. Brown, were elected regular members.

JULY 9TH, 1875.—SPECIAL MEETING.

Vice-President French in the chair.

Nine members present.

The special order of the evening was the discussion of the subject of "Mines," more especially the silver mines of Southern Utah. Mr. Geo. H. French was called upon, and gave a very interesting description of his recent trip to, and inspection of the "Star" mining district, in that territory. His remarks elicited a short informal discussion.

JULY 30TH, 1875.—REGULAR MEETING.

Mr. A. S. Tiffany in the chair.

Seven members present.

A valuable donation was reported from Col. J. H. Berryhill, of this city, consisting of the American Encyclopedia, 13 vols., and several other books.

Messrs. J. A. Le Claire, Henry Dalzell, F. H. Griggs, and Geo. W. French; Miss Harriet Rogers, Miss Lydia O. Barrette, Mrs. Geo. H. French, Mrs. W. M. Potter, Mrs. G. H. Ballou, Mrs. Wm. Allen, Mrs. Jos. A. Crawford, Mrs. Wm. Renwick, of Davenport, and Mrs. Ira Gifford, of Chicago, were elected regular members.

It was voted that the Academy bear the expenses of Dr.

R. J. Farquharson to the meeting of the American Association for the Advancement of Science, at Detroit, Aug. 11th, 1875, for the purpose of presenting before that Society his paper on Pre-historic Copper Implements, etc., and that he be authorized to take with him the necessary specimens for illustration.

AUGUST 27TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Ten members present.

A long list of donations was reported.

The Treasurer, Mr. A. S. Tiffany presented a statement of the finances of 1875, and tendered his resignation as Treasurer. Mr. Tiffany was requested to retain the Treasurership for another month.

Mr. Henry Runge, Mrs. John L. Davies, and Mrs. H. B. Huntington, were elected regular members of the Academy.

It was voted to keep the Academy rooms open during the Fair week, from 9 A. M. to 5 P. M. Messrs. Hazen and Pratt were appointed a committee to see that the rooms be kept open, with proper attendance. Several members volunteered to be present on different days.

Dr. Farquharson gave a brief account of the meeting of the American Scientific Association, at Detroit, and of the favorable reception of his paper on Pre-historic Copper Implements, &c.

SEPTEMBER 4TH, 1875.—SPECIAL MEETING.

Vice-President French in the chair.

The object of the meeting was the description by Prof. W. H. Pratt, of the mounds opened by himself, his son, and Mr. C. E. Harrison, in the vicinity of New Boston, resulting in the discovery of several copper axes, etc., [See Appendix,] and to arrange for a second expedition to the same locality. A committee was appointed to organize such an expedition.

The following resolutions prepared by Prof. Pratt, relative to the Toolesboro Explorations, were unanimously adopted:

Resolved, That the especial thanks of the Academy be, and are hereby presented to the Hon. Wm. Toole and Mr. Freeman Shaw, for their kind permission to open the mounds, and for affording, as they did, every facility for accomplishing the work; also to Messrs. Freeman Shaw, Geo. Shaw, Eli Reynolds, Hiram N. Matthews, Wm. B. Hooke, A. Kimball, and H. Cooper, for assistance with teams; and to Messrs. Chas. Melrose, Wm. Shaw, Daniel Hindman, Elisha D. Gilmore, M. L. Denison, C. L. Mosier, Sanford Smith, A. Sillick, G. W. Hooke, Freddie Willard, Charlie Willard, Mrs. Ada L. Hindman, Mrs. R. Guest, Mrs. Sarah Lowrey, Messrs. W. R. Colip, Charles Graves, Wm. Hobbs, and Jimmie Gellie, all of Toolesboro, Iowa, and to Dr. Thos. Willits, of New Boston, Ill., for valuable services rendered, and articles donated; also to Mr. Chas. E. Harrison, for his zealous co-operation, and very efficient aid in performing the work, and securing the results of the expedition.

Resolved, That the Secretary be instructed to cause these resolutions to be published, and to send copies of the same to the above named individuals.

Rev. Dr. Anderson, a former member of the Academy, now residing in Ohio, was present, and made a few appropriate remarks.

At a meeting of the Trustees held Sept. 18, it was decided to rent an additional room adjoining the one now occupied, in Odd Fellows' Block.

SEPTEMBER 24TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Fourteen members present.

The committee on Finance reported the accounts of ex-Treasurer Tiffany audited and found correct, showing a balance of \$32.55 in the treasury. The report was adopted and the committee discharged.

On motion, the resignation of Mr. Tiffany as Treasurer was accepted, and the Academy then proceeded to the election of a Treasurer. Mr. John Hume was unanimously elected to that office.

The resignation of Prof. W. H. Pratt, as Corresponding

Secretary, was presented and accepted, and Mr. W. F. Ross was elected Corresponding Secretary, *pro tem*.

Prof. W. H. Pratt was elected Curator, he having discharged the duties of that office since the resignation of Dr. Parry.

The officers of the Academy were requested to co-operate in the effort being made to obtain a selection of Models from the Patent Office.

Messrs. Putnam and Preston were appointed a committee to consider the propriety of proposing some amendments to the Constitution and By-Laws.

OCTOBER 15TH, 1875.—SPECIAL MEETING.

Rev. S. S. Hunting in the chair.

Several members and visitors present.

Dr. C. H. Preston read a paper on "Electricity," which was followed by some experiments, and an interesting discussion.

A request from the Clionian Society, to be permitted to hold their meetings in the Academy rooms, was received and granted.

OCTOBER 29TH, 1875.—REGULAR MEETING.

President Hazen in the chair.

Six members present.

Mr. Pratt reported the donation of a collection consisting of two copper axes, five copper awls, two stone pipes, and several horns, arrow-heads, etc., obtained from mounds near Toolesboro, by Messrs. Parsons, Shaw, Melrose, Hobbs, Sowash, Patterson and Shafer, of that place.

Communications were read from several societies, and individuals, requesting copies of the printed proceedings of this Academy. Also a communication from Mr. L. R. Witherell, proposing to deliver a lecture before the Academy, upon the subject of "Evolution," which was referred to committee on lectures.

Mr. Hume, on behalf of the "Ladies' Furnishing Com-

mittee," reported six cases for specimens, and one for books, had been procured at a total expense of \$107.55.

Messrs. John Rowe and Chas. E. Harrison, Mrs. D. L. Newcomb, Mrs. Alfred Sanders, Mrs. Robert Sickels, Mrs. H. M. Martin, Mrs. Dr. Fred. Baker, Miss P. W. Sudlow, Miss Mary Middleton, Miss Elizabeth D. Putnam, and Miss Mary Raff, were elected regular members.

NOVEMBER 5TH, 1875.—SPECIAL MEETING.

President Hazen in the chair.

A good attendance.

Mr. H. C. Fulton read a paper on "Wave Action," being a very interesting and instructive exposition of the Undulatory Theory of Heat, Light, etc.

The address was listened to with marked interest.

NOVEMBER 19TH, 1875.—SPECIAL MEETING.

President Hazen in the chair.

A large number present.

Mr. L. R. Witherell delivered a lecture on "Evolution," which he illustrated with maps and charts. His statements elicited considerable discussion, and further consideration of the subject was set for the next meeting. The thanks of the Academy were tendered the Lecturer.

NOVEMBER 26TH, 1875.—REGULAR MEETING.

Vice-President French in the chair.

A communication was read from Capt. Stuyvesant, offering to address the Academy sometime after Dec. 1st. Also a letter from Senator Wright, stating that a collection of about 200 models from the Patent Office had been prepared for shipment to the Academy.

The Librarian was authorized to have the Proceedings of the Philadelphia Academy and other pamphlets bound as soon as practicable.

The following resolutions, presented by J. D. Putnam, were adopted:

WHEREAS, The objects of the Academy are the increase and diffusion of a knowledge of the Natural Sciences by the establishment of a Museum the reading and publication of original papers, and all other suitable means; and,

WHEREAS, Many original investigations have already been made by our members, some of them being of general, as well as scientific interest; and,

WHEREAS, The publication of our proceedings would be advantageous to the Academy, in many particulars, *e. g.*

1st. It will preserve much material that might otherwise be lost.

2d. It will furnish a greater incentive to our members to make original investigations.

3d. It will increase the Library by means of exchange with other societies and publishers; and,

4th. It will place us on a creditable footing with the other Societies of the world. Therefore be it

Resolved, That the Academy begin the publication of its proceedings with the least possible delay; and

Resolved, That a committee of five be appointed, of which Messrs. Pratt and Putnam, (ex-secretaries) and Dr. Preston, (present Secretary,) shall be members, to decide as to the best form of publication, as to title, etc., and to prepare the records and make selections of reports, scientific papers, etc., and determine on the publication or non-publication of each.

In accordance with the above resolutions, Messrs. W. H. Pratt, J. D. Putnam, C. H. Preston, R. J. Farquharson, and Geo. H. French, were appointed a committee on publication of proceedings.

Mrs. W. J. Skinner, Mrs. M. A. McGonegal, Mrs. M. L. Stuyvesant, Messrs. W. J. Skinner, Manily T. Brown, Levi Humphrey, John C. Putnam, G. W. Fitch, Thos. Thompson, Jas. Thompson, H. St. Clair Putnam, J. E. Freeman, R. H. Wells, and Capt. M. L. Stuyvesant, were elected regular members.

It was voted to announce that the Academy rooms would, until further notice, be kept open from 10 A. M. to 12 M., each day of the week.

On the evening of Nov. 29th, Rev. W. E. Copeland, of Lincoln, Neb., delivered a very interesting lecture on the

Mound-builders, in the Unitarian Church, under the auspices of the Academy.

DECEMBER 10TH, 1875.—SPECIAL MEETING.

President Hazen in the chair.

By request, Capt. M. L. Stuyvesant gave a very interesting account of "The Great Earthquake Wave of August 13th, 1868."

The speaker prefaced his remarks by a very graphic description of the various drills, etc., constituting the daily life on board a man-of-war, describing the patriotic festivities on our national birthday, as the ship, the U. S. steamer "Wateree," lay for repairs in the quiet roadstead of Arica, the seaport of Tacua, in Peru. The memorable 13th of August, breezy and bright, giving no admonition to the placid harbor, with its shipping and low-built adobe town, was well pictured, as was also the sudden series of rattling shocks, which at about 5 o'clock P. M., shattered the frail village to dust and ruins, and sent the waters of the harbor seaward. Then came anxious hours of preparation and suspense, till at dark, the returning wave presenting a terrible front over forty feet high, came rolling in, but fortunately broke before striking any of the vessels; overturning them however, save the "Wateree," which during the following night of commotion, was carried ashore and left high and dry, by the receding waves. The scene of desolation which the morning revealed, the wrecked shipping and town, was vividly portrayed.

DECEMBER 17TH, 1875.—SPECIAL MEETING.

President Hazen in the chair.

A full attendance.

Capt. W. P. Hall delivered an address on the Origin and History of the Mound-builders, advancing the theory that they were descendants of the tribes of Israel, and came to this country many centuries ago.

A proposition from the Ladies Centennial Association

to print the Proceedings of the Academy, was referred by the President to the Board of Trustees.

At a meeting of the Trustees, held Dec. 20th, the following resolution was adopted:

WHEREAS, The Academy has received a proposition from the LADIES CENTENNIAL ASSOCIATION to publish the Proceedings of the Davenport Academy of Natural Sciences to Jan. 1st, 1876.

Resolved, That the Board, in behalf of the Academy, accept the proposition, and tender our hearty thanks for this generous aid in furthering the interests of the Academy.

Resolved, That the committee appointed by the Academy, to whom was intrusted the preparation of the records and selection of reports, scientific papers, &c., be requested to furnish to this Board the matter designed for publication, with as little delay as possible.

DECEMBER 31ST, 1875.—REGULAR MEETING.

President Hazen in the chair.

Six members present.

The committee on amendments of the Constitution reported some alterations, the consideration of which was laid over until the next meeting.

Numerous donations were reported.

Mrs. J. C. Bills, Mrs. J. B. Phelps and Mr. H. C. Fulton, were elected regular members.

JANUARY 5TH, 1876.—ANNUAL MEETING.

President Hazen in the chair.

Twenty-three members present.

The Treasurer, Mr. John Hume, made his report on the Finances of the Academy, showing:

Balance on hand at last annual meeting.....	\$ 12.40	
Receipts during the year, from initiations, dues, subscriptions, etc.....	521.77	\$534.17
Expenditures for rent, fuel, books, furnishing, &c....	491.87	
Balance on hand in Ladies' Furnishing Fund.....	42.30	\$534.17

The report was approved.

Dr. Farquharson, Librarian, reported that 118 volumes had been added to the Library during the year, all but four by donation. The Library now contains 362 volumes, besides a considerable number of pamphlets.

Mr. W. H. Pratt, Curator, then presented the following report on the

Condition of the Museum.

Gentlemen and Ladies of the Academy:

On account of the very rapid accumulation of specimens of almost every variety, and the many necessary changes of rooms and cases, together with the want of specimen trays or boxes, and labels; and having been but a few months in charge of the museum, and with but a very limited amount of time to devote to the work, I am unprepared to report as well ordered and classified arrangement of the whole collection, as I had hoped to do. I can present, however, the following approximate statement of the collection now in the rooms, a small portion of it—which I cannot now designate in detail—being on deposit here, with the probability that it will become the property of the Academy, as all the rest now is,

MOUND RELICS.

Copper Axes,	20 specimens.
“ Auls,	11 “
“ Beads, about	200 “ of 4 varieties.
Carved Stone Pipes—animal forms,	6.
“ “ “ plain,	8.
Horn and Bone Implements,	20.
Marine Shells,	4.
Shell and Pearl Beads, several forms.	
Several specimens of galena, mica, arrow-heads, decayed wood, &c.	
Skulls of Mound-builders,	21.
And a considerable quantity of bones.	

ANCIENT IMPLEMENTS.

Stone, about	300.	Flint, about	700.
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MODERN INDIAN IMPLEMENTS, ETC.

1 Bow; 10 Arrows; 1 Tomahawk. 6 Pipes of pipe-stone.

GEOLOGICAL.

Fossil shells,	about 175 species.
“ Corals,	“ 80 “
“ Crinoids,	“ 50 “
“ Coal Plants,	“ 60 “

Minerals, Ores, and Crystals, 2 Cases.

Primitive rocks, including a typical collection of 50 specimens, labeled, one case.

Geodes, about 50 specimens.

NATURAL HISTORY.

Plants pressed and labeled,	2,100 species.
Marine shells,	200 “
“ Corals, sea-weeds and sponges,	25 “

Crabs,	6 species.
Turtles,	6 "
Fresh-water and land shells, local,	100 "
" " " " other localities	50 "
Birds mounted,	87 specimens.
Mammals " 18 "	
Skulls of Mammals,	19 species.

SPECIMENS IN ALCOHOL.

Snakes,	23 bottles.
Lizards, Frogs, &c.,	12 "
Other specimens,	32 "

A few specimens of birds' nests and eggs.

Several specimens of Chinese and Sandwich Islands work, and a considerable number of historical relics of much interest, have also been contributed.

The articles are all placed in about 80 feet in width of wall cases, one glass show case, with large glass case beneath, three botanical cases and a few small bird cases.

The plants are perfectly arranged, classified, and labeled by Dr. Parry and Mr. J. G. Haupt.

Of the rest of the collection, about two-thirds are tolerably arranged, and a great deal of work remains to be done to bring it into proper order, requiring also several more cases, and some specimen trays or boxes, and suitable labels.

Respectfully submitted,

W. H. PRATT, *Curator*.

The report was accepted.

The election of officers for the ensuing year, resulted as follows:

President—PROF. W. H. BARRIS.

Vice-President—GEO. H. FRENCH.

Recording-Secretary—DR. C. H. PRESTON.

Corresponding-Secretary—MRS. M. A. MCGONEGAL.

Treasurer—JOHN HUME.

Librarian—DR. R. J. FARQUHARSON.

Curator—W. H. PRATT.

Trustees—WM. RIEPE, D. S. SHELDON, C. E. PUTNAM.

The retiring President, Dr. E. H. Hazen, then delivered his

ANNUAL ADDRESS.

Ladies and Gentlemen of the Davenport Academy of Natural Science:

One of the conditions which the constitution of this society imposes upon him who receives the honor of being its presiding officer

is, that "he shall, at the annual meeting, make a report on the condition and progress of the Academy in all its departments."

In thus fulfilling my duty, I take great pleasure in showing our prosperity for the year. We have had thirteen regular meetings and seven special or adjourned meetings, besides a series of *conversazioni*—the latter meeting every week last winter. These meetings have been well attended. Many volumes have been added to the library, making now a total of 362 bound volumes, besides a large number of unbound ones, the estimated value of all being between eight and nine hundred dollars.

There are now seventeen double cases and seven smaller ones, well supplied with specimens and books. The rooms have been made attractive with carpeted floors, tables, chairs, curtains, etc. For these fixtures and this furniture we are indebted to the lady members, through the personal efforts of Mrs. C. E. Putnam, who has been indefatigable in her interest during the year. The funds accruing from this membership up to the present time, have been set aside to the furnishing fund, and have been judiciously expended in making the rooms attractive to visitors and comfortable for the meetings of the society.

The value of our possessions as a society does not wholly consist in what has been purchased with money. The donations of minerals, shells, birds, botanical and archæological specimens have been very profuse, and attest the interest of members and friends. The arranging and labeling of these donations has involved great labor. The work of the Curator, Mr. W. H. Pratt, has thus been made arduous; but close inspection of the cases will show the duties well performed. This locality is rich in opportunities for investigation in the young science of archæology, and fortunately we have members with enough zeal and patience to closely inspect the ancient mounds all around us. Messrs. Tiffany, Pratt and Hall, have added much wealth in this branch, and Dr. Farquharson has given us the literature of the subject.

Subscription papers have been numerous among us for special objects, and members have subscribed liberal sums, which will not appear in the report of the Treasurer, such as Mound fund, a fund for the purchase of minerals, etc. The interest engendered among the lady members has resulted in an organization known as the Woman's Centennial Association (which may be considered as a branch of the Academy) the purpose of which is to prepare work for the Exposition in Philadelphia, the funds accruing from the sale of articles exhibited to revert to the Academy. Their enthusiasm was well demonstrated in the tea party at one of our large halls, the net proceeds of which amounted to \$176.00. In addition to all this, the Woman's Association has shown its continued good will in voting to undertake the enterprise of publishing the Academy's proceedings, with fit illustra-

tions, from its inception to the present time.

These are strong evidences of the Society's prosperity. The present condition of our Academy calls to mind the last annual meeting, when we assembled in one of the two rooms we now occupy (the extent of our accommodations then) when only nine members cast the votes which elected its officers for the year. We had no great expectations, and were satisfied with the prospect of growing in the same ratio as in years before. In 1870, when we first occupied rooms independent of our sister Library Association, we commenced housekeeping in the lower part of the city in a ten by ten room into which the light of day came not through front windows, but through rear ones opening into the back yard of a livery stable; at night a cheap kerosene lamp rendered our gropings more distinct. There we met like cave dwellers around a skull, shell or new book and wondered why the spirit of science did not diffuse itself throughout our community and extricate us from the embers of our poorly supplied hopes of better days.

Withal, had we not the evidence in that room of efforts well directed? There stood a good telescope which had often pointed at the worlds above. There was the camera which photographed the eclipse the year before. There was a good library, so far as it went, but which two of us could have carried at one lift to better quarters, if we had had them; also a load of stones and rocks, most of which were upon open shelves. All of these possessions evinced well directed efforts, but at that time their shadows thrown on the wall by the old lamp were like specters, the effect of which few of us, who were not there, can imagine, unless they have done duty with scalpel late at night, in the upper rooms of a medical college.

After a struggle of five years, we may to-day rejoice in the knowledge that substantial success is ours, and our future is promising.

Need it be asked why we urge the citizens to support such an institution in our midst, in a liberal manner?

The cultivation of scientific observation in the minds of the young people, is more and more appreciated, and science, now is almost entirely emancipated from the prejudice with which it has long been enslaved by a certain class of people. Slow has been the march of superstition and false theories out from the midst of our conceptions, and the freedom of the atmosphere which we are beginning to inhale, is stimulating and toning toward a new life. The mission of science is to aggregate facts, from which to make deductions. How much science has done for our every day life, can easily be shown—it has within our nation's existence, brought distant climates within a journey of a day or two; by it two hemispheres compare market prices in the same hour; through its teachings the out door air is cleared of its noxious vapors; houses are better warmed, lighted and ventilated; through it of late we read every morning with a ninety per cent cer-

tainty of what the weather will be for the next twenty-four hours.

These advances are sufficient to secure us against famine, pestilence, and to some extent, disaster, besides securing comfort, health and ease.

Science has done as much for the mind, in freeing it from bigotry and superstitious ideas of hob-goblins, and the devil. It puts a man on a self-reliant basis, and proves that by the sweat of his own brow he must earn his bread.

With the present advantages of science, what the future holds out to us through our faith in its reliability, it is difficult to conjecture.

With the stability of Nature, and the saturating influence of our public school system, and the freedom of thought in a Democratic government, and the elevating principles of Christian teaching, may we not expect the Yankee genius to outstrip the world in its exposition of the fruits of practical science!

We need not, then, blush to ask our fellow-citizens to support an institution, the tendency and direction of which is leading on to so great utility. Although the stones exhibited are cold, the bones dry, the feathers dead, and the insects dusty, yet the discipline gained in their study, and their suggestive bearing tell in maturer reflection.

You will allow me to make a few remarks upon the subject of the relation an association like this, bears to the community upon whose good will we so greatly depend for the carrying out of our objects.

The officers of such societies are the custodians of the funds turned into it, and are the administrators of the affairs which carry out the objects and aims of the body, and from whatever source its income—whether dues, gifts, festivals or endowments—they agree (or such pledge is implied) by taking the funds, that they will be expended for whatever agreed and in accordance with the constitution. * * * *

The President is, to a great degree, responsible to an association for the administration of its constitutional formula; also that the wishes of the society are carried out by those handling the funds, and a sentiment should pervade the whole society which sustains him in his administration of its wishes.

I think it indispensable, moreover, that this association should have a printed constitution and by-laws, and these be distributed to donors and members, to inform the latter of their privileges, and to furnish information as to the manner in which contributions are received and business conducted.

We might indulge here in expressions of future anticipations. Our hope lures us to believe that we shall have an endowment fund, and a fire-proof building, and our faith in the community says it shall be so; but let us now be satisfied with a slow, if it be a well-developed, growth; and now that we stand upon a good basis, let us build a superstructure that will be worthy of comparison with any institution of like kind in the West.

E. H. HAZEN, *President.*

APPENDIX.

PAPERS, REPORTS, ETC.

Do Rifle Balls, when Striking the Animal Body, Burn?

BY R. J. FARQUHARSON, M. D.

[Read before the Academy January 28th, 1870.]

For a long time after the use of fire-arms the vulgar idea prevailed, that the combustion of the "villainous saltpetre" somehow communicated a poisonous quality to the ball, and thence to the wounds inflicted.

After this was abandoned, the idea prevailed that the ball was heated by friction, in passing through the air, and burnt the wound. This idea existed in the time of Ambrose Paré, for we find this celebrated surgeon, in his works, published in 1525, refuting it, by the well-known fact, that a rifle-ball passes through powder without igniting it. This apparent refutation has been copied by successive writers, until we find it mentioned even by Nelaton, at present the surgeon of Napoleon the Third. The error is in not considering the facts, that the ball must stop to be heated much, and that gunpowder cannot be ignited below 600° below Fahrenheit.

We shall now briefly mention some of the facts, elicited in the investigation of the new theory of heat, and also in the recent experiments in gunnery, which have been made in England, to solve the question of the penetrating power of cannon balls, *versus* the protecting power of iron plates, facts which go far to render exceedingly probable the belief that rifle balls, when stopped by the animal body, do burn.

The amount of heat, generated in a ball by friction of the air, is but small, owing to the low velocity, not over 1,600 feet per second but that such friction is competent to produce great heat, is shown by the aerolites or shooting-stars, which have a planetary velocity of from 18 to 36 miles per second, when they enter our atmosphere, and the amount of heat generated by friction is so great, as in most instances to dissipate the metallic constituents of these bodies as a vapor. Tyndall proved by experiment, that a lead ball, falling 26 feet and stopped at the foot of its descent by an iron plate, has its temperature raised above that of the air of the room, as shown by applying the ball immediately to the face of a thermo-electric pile. The quantity of heat which is generated is divided between the ball and the iron plate; if it was all in the ball, it could be easily calculated by Joule's law, as a body falling 26 feet, which is $1/30$ of 772, would raise an equal weight of water $1-30^{\circ}$ F.; but the heat capacity of water being thirty times that of lead, the lead is varied thirty times as much or 1° F. Now we can also easily calculate the amount of heat generated in a rifle ball, when suddenly stopped by a solid body. It is a well-known law that the height of a falling body is as the square of the velocity, consequently the heat must be as the square of the velocity; a lead ball falling 772 feet has a velocity of 223 feet per second, and if stopped suddenly, as shown above, a heat of 30° F; but a rifle ball has

a velocity of more than 1338 feet per second, or 6 times 223, and therefore the heat generated is the square of 6 or 36 times as much, or 36, times 30°, or 1080° F., more than enough to melt the ball, but only a part of this heat is retained in the ball, it being divided between the ball and the target, or arresting body.

When we examine the case of the great iron balls, such as were used in the experiments in gunnery, at Shoeburyness in England, the great quantity of heat generated is much more evident. The mechanical effect is known to be "as the mass of the body multiplied by the square of the velocity, and as the heat of the stopped ball is the same, the quantity is immense." An eye witness says, "a flash of light is seen, even in broad day, when the ball strikes the target and it is found after collision, often hissing hot." That these huge balls become red-hot at the moment of impact is shown conclusively by the following fact. Formerly to make a shell explosive by impact, it was necessary, either to make it oblong and place the concussion powder in the heavy end, or in the case of a spherical shell to use what is known as the inertia fuse, which secures the action of any part striking upon the concussion powder. But all percussion shells are dangerous to handle and to transport, especially on shipboard. Now a new kind of powder has been devised, of greater power than ordinary powder, which is composed of charcoal, picrate of potash and nitrate of potash, this powder cannot be exploded by percussion, and it requires a heat of not less than 590° F. for ignition; but a shell filled with this powder explodes immediately on striking an iron target, proving that it must have attained a temperature of at least dull-heat at the moment of impact.

Now we may safely say that balls do burn.

Balls are generally of lead, sometimes of iron, and again sometimes, though rarely, of copper, the escopette balls, used by the Mexican in our late war with them, being of that metal. Now which of these balls, lead, iron or copper, would have the greatest burning power; for different bodies do not have the same heat or burning power at the same temperature. If you take three balls, one each, of iron, lead and copper, and heat them to the same degree, by putting them in oil at 180° F., and then place them upon a thin disc of wax, they will burn or melt through, in succession, as follows: first, the iron, then the copper at a very short interval, and lastly at a still greater interval, the lead. Now what makes this difference in the burning power of different metals, and what determines the difference? Why the specific heat or capacity for heat, and how is that found out? By determining the relative quantity of heat absorbed in being raised from 32° F. to 212° F.; or easier, by the quantity of ice melted in cooling from 212° F. to 32°, which is from 100° to zero of the centigrade thermometer.

This strange property of metals to have different specific heats, or

in other words different capacities for heat, is not determined by the mass or specific gravity, nor by the conductive power of the different metals, as at first sight it would seem to be, as is shown in the following table, a list of metals, in which silver as possessing the highest conductive power is taken as a standard, and the other metals compared with it.

Name of metal	Conductive Power.	Specific gravity.	Specific heat.
Silver.....	1000	1000	1000
Copper.....	740	836	1668
Gold.....	580	1846	568
Tin.....	150	692	986
Iron.....	120	692	1996
Lead.....	90	1086	550
Platinum.....	80	2114	568
Bismuth.....	20	942	540

Or the eight metals stand thus in order:

Name of metal.	Conductive Power.	Specific gravity.	Specific heat.
Silver.....	1st.	4th.	3d.
Copper.....	2d.	6th.	2d.
Gold.....	3d.	2d.	5th.
Tin.....	4th.	7th.	4th.
Iron.....	5th.	8th.	1st.
Lead.....	6th.	3d.	6th.
Platinum.....	7th.	1st.	5th.
Bismuth.....	8th.	5th.	8th.

As the burning power is directly as the specific heat, the burning power of the three balls as seen by the above list is, 1st, iron; 2d, copper; and 6th, lead.

In conclusion, I would say, that stopped balls do burn; that no surgical writer of the present time, within my knowledge, alludes to this fact, and that some phenomena of gunshot wounds hitherto inexplicable, are easily enough accounted for by this theory of heat, but to enlarge on this subject would be out of place here.

DAVENPORT, IOWA, Nov. 26th, 1869.

At the meeting on February 26th, 1875, Dr. Farquharson called the attention of the Academy to a paper read by him, in 1869, on the heating of rifle balls, when stopped by the body of an animal.

He read extracts from an account of experiments made last year at Spandau, Germany, by Dr. Küster, which were a practical confirmation of his theoretical deductions in the former paper.

Quotations from an article in the *New York Medical Record*, for October 1st, 1874, by Dr. Augustus Küster, of the Augusta Hospital, and first printed in the *Berliner Klinische Wochenschriften*.

"In a paper read last year before the German Surgical Congress, Professor Busch, of Bonn, called attention to the fact that a Chassepot bullet, when shot from a short distance into the human body, made a simple aperture of entrance, but that its aperture of exit

was larger than a fist, and that there was very extensive fissuring and crushing of the bones." Dr. Busch supposed that the ball became melted, and broken up by forcible contact with a hard substance, and acted like a mass of shot on the parts lying behind. Dr. Küster, at the time when Dr. Busch's paper was read, had made a similar observation as to the effect of the bullet, but could not adopt Dr. Busch's explanation. He had since made a number of experiments (with the courteous sanction of the Minister of War, who had placed at his disposal arms, ammunition, and men) which, with the assistance of Major Schenck, were carried out at the Royal Military School, at Spandau.

"In making the experiments, a large target was placed behind the animals, so as to enable the condition of the bullets to be observed after their passage through the body. The distances were five, twenty, one hundred, and eight hundred paces. The arms used were a sporting rifle with a pointed bullet, the needle gun, Chassepôt, Mauser, and Henri-Martini rifles; the animals used for the experiment were horses and wethers. The latter were first killed by a volley from all the weapons; then shots were discharged at the dead body, and after eight days a further series of experiments were made on the carcass, which was at that time undergoing decomposition. The following are the general results of the investigation:

1. There is no essential difference in the action of bullets on the living and on the dead body. With reference to this subject, Dr. Küster calls attention to the fact that, in consequence of the greater toughness of the skin of animals, the aperture of exit is not so large as in the human body. In one case the skin was so tough that the point only of the bullet penetrated the skin of the back, and its force was then diminished. On dilating the opening and introducing the finger into the wound, there was found to be just as extensive destruction of the soft parts and bones as in the human body. It was only in those parts where the skin was thinner and lay close to the bones as in various parts of the head of the horse, that it was sometimes torn to a greater extent, but never so much as in man. The injury of bones, however, was not less than in a human subject.

2. The extent of the destruction is in inverse ratio to the distance and in direct ratio with the initial velocity of the bullet. At eight hundred paces, although the characteristic peculiarities of the wound were still present, they were generally reduced in intensity. The smallest wounds were produced by the sporting rifle (Jagdbüchse); the bullet, although put out of shape, remained entire in the body, even when discharged at short distances. Then followed the needle gun, the Chassepôt, and the Mauser rifle, which produced trifling destruction of the bone and soft parts.

3. The destruction of the tissues is produced by the lead becoming heated by collision against a solid substance, and consequently, broken up, but without being melted. The bullet is mechanically di-

vided; it leaves the finest particles of lead in the recesses of the wound, while the fragments of larger size pass out along with the pieces of shattered bone. On this point Dr. Küster differs from Professor Busch, who supposed a melting of the lead. Busch's views derive confirmation from the fact, that when a lead bullet is fired against an iron target, the lead is spread out in the shape of a star, and this, it is argued, shows that it becomes melted. But Schadel, of Heidelberg, hung a small bag of powder before the target; the bag was repeatedly torn by the splinters of the bullet, but without producing an explosion, which must have taken place if the lead had been melted. There must also be a great difference, according to whether the bullet traveling with full force, is completely arrested, or meets with an obstacle which it can overcome.

At the meeting of German naturalists in Weisbaden, Professor Busch related some experiments to show that lead loses its cohesion in proportion as it is heated. If two bullets, one cold and the other heated, be allowed to fall on a stone from the height of six feet, no impression will be made on the first, while the second will be distinctly flattened. That a heating of the ball does take place is an evident result of the physical law that, whenever it meets with resistance a part of the force is changed into heat; and further, when a bullet remains sticking to the target, it is always warm. Again when a bullet is discharged at a short distance into a heap of moist sand, the edges and the farther end of the channel made by the bullet are always warm. By these facts, the manner in which the injury is produced in the animal body is easily explained. The bullet shatters the first bony lamellae with which it comes in contact, becomes heated and is consequently broken into several fragments against the projecting portions and angles of the bone. In correspondence with this destruction of the bullets, the wounds made from short distances by the Chassepôt and Mauser, which have the greatest initial velocity, were frightful. Most of the bullets passed through the animals' bodies, reduced by one-half or more, and greatly altered, and made on the target an irregular impression, surrounded by a crown of small pieces of lead. Along with these were found fragments of bone, muscle, hair, etc. Dr. Küster does not remember having once seen a simple bullet-opening in the target.

"The next point was to observe whether hardened balls have the same effect. This was *a priori* not improbable, as Pirogoff had noticed the remarkably extensive splintering produced by the copper bullets of the Tscherkesses. Dr. Küster, however, found that,

4. "The injuries described are produced only by balls of soft lead, not by those of hard lead. Bullets of hard lead are used with one only of the modern weapons—the English Henri-Martini rifle.

"The hardness is produced by amalgamation of the lead with tin in the proportion of 12 to 1. The initial velocity of this rifle is nearly

as great as that of the Mauser, and yet the wound produced by it is very much smaller. While with the latter, the aperture of entrance into the bone was irregular, and very often extensively splintered, and while the amount of crushing increased in extent, in the track of the ball, the Henri-Martini made always a simple, and more or less circular opening.

"If the edge of a rib were hit, the loss of the bone formed the segment of a circle corresponding to the circumference of the ball. The aperture of exit was also generally roundish, though larger; there was either no splintering, or it was limited to the immediate circumference of the aperture. The hole in the target was without exception simple, and the ball, when found in the target, was not at all, or only slightly misshapen.

"Dr. Küster has never found splinters of lead in the track of wounds made by these bullets. In one case only did he find a bullet of this kind much misshapen, it had been fired at a distance of 100 paces, and remained sticking in a bone.

"Dr. Küster states, as a fact of importance, that at a distance of 100 paces, the Henri-Martini bullets, with one exception, passed through the greatest diameter of the body of a horse, while the Mauser bullets frequently remained in it.

"This is explained by the greater resistance which the latter have to overcome in consequence of the greater amount of misshapement which they undergo; it shows also that the passage of a ball right through the body generally indicates less danger, than when it remains in it."

Report on a Geological Examination of the Section of the Bluffs recently exposed by the C., R. I. & P. R. R.

BY W. H. PRATT.

[Read January 11th, 1869.]

(Plate XXXII.)

In accordance with the suggestion of Dr. Parry, at the October meeting, I have taken occasion to watch the progress of the excavation of the C. R. I. & P. R. R. track through the bluff, west of the city, and to note the arrangement and position of the deposits exposed, and to collect specimens of all the relics of the ages, which are to be found there.

I herewith present a sketch of the strata as now exhibited; also a series of specimens of the several soils, wood, moss, shells, calcareous nodules, glacier-scratched boulders, etc., for the collection of which this work affords a very favorable opportunity.

The surface of the prairie, which at this point extends to the edge of the bluffs, is somewhat undulating, highest almost at the extreme edge, and gently sloping backward toward the north.

The cut is nearly in a north and south direction, and at the deepest part is forty-four feet below the prairie surface.

Beneath the recent soil (marked 1, on the diagram,) which is one foot in depth, is about twenty feet of the usual "yellow clay," No. 2. The lines of stratification in this stratum consist principally of iron-stained streaks, and occasional thin layers of sand interstratified, and frequently a distinctly laminated structure, the laminae being much curved. Many calcareous sandy concretions of one or two ounces in weight, are found in this yellow loam, which in all respects corresponds very closely with the *loess* of the valley of the Rhine, as described by Sir Charles Lyell, and indeed he also alludes to the formation "which borders on the great plain of the Mississippi," as being of the same character. This loam also contains some shells among which are found *Succinea obliqua*, *S. avara*, *Helicina occulta*, *Pupa fallax*, and *Helix striatella*, extremely fragile, but unbroken, which latter fact, in connection with the general uniformity and horizontal position of the strata shows that the whole must have been deposited in comparatively still waters.

This clay makes excellent brick.

Next below the yellow clay, the line of division being, in some places, not very distinct, is a layer, varying from three to five feet in thickness, of bluish-gray clay, No. 3, containing a few shells of some of the above named species. This clay presents no lines of stratification whatever, and there seem to be strong indications of it having been thrown down rapidly and very soon after the submergence or overflow which changed this whole region into an immense fresh water lake.

The above described layer rests directly upon a bed, one foot thick, of brown peat, No. 4, which, when thoroughly dried, will burn, though it is very poor fuel. In some places the forms of the peat moss—*Hypnum aduncum*, as determined by Prof. C. H. Peck, State Botanist of New York—are preserved; and considerable quantities of much decomposed coniferous woods, some pieces being several inches in diameter, are found distributed through the peat bed. As no roots are found penetrating the soil, it seems doubtful whether the wood grew in the immediate locality.

Below the peat is the "ancient soil", No. 5, two feet in depth. This is a rich vegetable mould, of a dark brown color, much resembling the peat itself, but more decomposed, more earthy, and darker.

Both the soil and the peat are of very uniform thickness, and exactly horizontal, while the overlying strata correspond in some degree with the contour of the prairie surface. No shells or other fossils have as yet been observed in this soil.

Underlying the old soil and extending to the bottom of the excavation—about eighteen feet—and probably much lower, is the boulder



drift, No. 6, consisting of a very tenacious "blue clay", intimately mixed with fine sand and containing much gravel and small boulders, and growing coarser as we descend. No shells or other organic remains have been discovered here. The pebbles and boulders of this formation have been all smoothly water-worn, and very many of them have subsequently been scratched and ground by glacial action, of the prevalence of which, in this latitude, at some remote period, they afford good additional evidence, fully in accordance with the "glacial theory" so ably maintained by Prof. Agassiz, and now generally accepted as a truth.

It is quite apparent that all these strata were deposited before the mighty river, which, at a later period, filled the valley from hill-side to hill-side, had excavated its broad channel and the bluffs had assumed their present form, and before any strong currents were established in the waters which accomplished the work. This is shown by the fact that all the strata, including the old soil and peat bed, extend entirely unchanged to the edge of the bluff, out-cropping where not hidden from view by land slides or by the recent soil.

A tusk, several molars and some bones of a mammoth (*Elephas primigenius*) of a race whose last individual roamed over the continent ages ago, were exhumed a few days since by the steam excavator, and traces were observed of other portions of the skeleton entirely decomposed. This was found at the junction of the yellow and bluish clays, (at *a*), three feet above the peat bed, indicating that the skeleton was deposited after the blue stratum, the body having floated there, upon the waters, or the creature perhaps having "waded in" to his destruction. The tusk was considerably broken by the machine, but was nearly all secured. It was nearly seven feet in length, very much curved, and measures four and three-fourths inches in diameter at the base. One of the molars weighs nine and a half pounds. These articles are in the Griswold College Museum, in this city.

One of the chief circumstances indicating that the clay No. 3, next above the forest bed was deposited suddenly, is the appearance of an ancient ditch, (shown at *b*, in the figure,) which was cut through the peat bed and soil, and considerably below, its whole depth being about six feet. It would seem that if this had been exposed to the action of a flood of still water for any considerable time, the black soil at its sides would have been softened and disintegrated, and settled down somewhat into the bottom and the light colored clay in settling gradually into the ditch, would necessarily have become much mixed with it, and if in running water it would still more certainly be so. It is however, distinct all the way down, the line between them being as sharp as a lead pencil mark on paper.

The clay within the ditch is as clean, and every way precisely the same, as that extending over the whole surface, (No. 3,) and perfectly continuous with it, and without the slightest appearance of separation.

A sudden overflow of the clay upon this region, might account for the position of the elephant bones *several feet above* the old surface, by the animal being overwhelmed by it, and perishing there.

Report of Explorations of the Ancient Mounds at Albany, Whiteside County, Illinois.

BY W. H. PRATT.

[Read August 29th, 1873.]

Gentlemen of the Academy:

Having been commissioned by the society to make some explorations of the mound region in the vicinity of Albany, Illinois, I proceeded to that place in August of this year, 1873, and with my son, who went with me, spent three and a half days in the work, of which I beg leave to present the following report:

The village of Albany is situated on the east bank of the Mississippi, in Whiteside Co., Illinois.

The course of the river at that point is about S. S. W.

Over the bluffs in the neighborhood is a growth of young oak trees, the largest of which are ten or twelve inches in diameter.

On the bluff and the slope toward the river, about a mile south west of the village, scattered irregularly over an area of about one-fourth by three fourths of a mile, are fifty-one ancient mounds, the positions and dimensions of which I have approximately determined. A general view of the whole is presented in the accompanying plan. The land is owned by Mr. Sam'l Rosenkranz, who kindly allows the exploration and excavation of the mounds without restriction, except the reservation of three of the most prominent.

A few other mounds are said to exist not far distant to the north east, also some others a little distance south, but I have not seen them. It is also stated that two or three were removed some years since in making the grade for the Western Union R. R., which passes close by the mounds, between them and the river.

Over the area above mentioned, the young timber has been mostly cut off, and on the higher portions evidently very few trees have of late, if ever, existed. The soil is almost entirely sand. The high land or bluff terminates abruptly to the southward in a bold, narrow point.

A position on one of the highest mounds, (H) some of which are situated on this point, commands one of the broadest views to be found in the whole Mississippi Valley, with a sweep of more than half a circle, including the river and valley and islands to the north and west and south west, and to the south and south east the "Dosia", as it is commonly called, or "Maredosia slough", or, as it was originally named, the "Marais d'Ogee", an ancient channel of many miles in extent, connecting the Rock River with the Mississippi. In this the current flows in either direction, from the higher toward the lower of

the two rivers at different times. The "slough" is a broad marsh, nearly dry during a dry season, and is believed to have been once the channel of a part of the Mississippi, which divided at this point, and re-united at the present mouth of the Rock River, forty miles below.

The location is one of rare beauty and has doubtless been for ages, as it still is, a favorite resort of hunters. The high point above named is a narrow and rather abrupt sand ridge, formed, no doubt, by the action of the current, when the Father of Waters occupied the entire breadth of the valley.

There is nothing in the relative position of the tumuli, as will be readily seen by reference to the diagram, to indicate any arrangement or design whatever, except to construct them where it could be done with least labor, by taking advantage of the ridges and slight elevations of loose and sandy soil.

The structures vary in height, from two to twelve feet, the diameter being five or six times the height.

They are usually circular, only four or five being elliptical, the length of these about double the breadth, and the longer diameter being parallel with the river. The outline of surface is such as would naturally result from a rounded heap of sand or loose earth, exposed, for ages, to the action of the elements, the surface being protected by such grasses, plants, bushes, or trees as the soil would produce. The exact height and diameter are consequently difficult to determine, but it would appear that they had originally been from four to fifteen feet in height and perhaps four times those measures in diameter.

All of the largest mounds and several of the smaller are upon the high ground, from one hundred and twenty to one hundred and fifty feet above the river. The rest are on the slope between it and the river. I selected for examination one of several similar mounds, which were situated in a row parallel with the river, and but a few rods northwest of the sandy ridge, at some fifty feet lower level, and on ground sloping gently toward the Mississippi, which is distant about one fourth of a mile.

This mound is marked 1 on the plan.

It was about four feet high and twenty-five in diameter. This mound is composed, as are the most of those which have been opened, of a loose fine sand, with here and there a stone of two or three pounds weight or more, of the Niagara limestone and the sandstone common in this region, many of them evidently having been subjected to the action of fire before they were placed there.

No floor, wall, or internal structure of any kind was found, and the same is the case in almost all instances in this district. Making an excavation from one side and toward the middle, on reaching a depth of six feet from the top, a quantity of human bones was discovered lying about in the center of the mound. Seven adult and one child's skulls were exhumed, the latter falling in pieces as soon as it was removed.

The adult skulls were more or less crushed and distorted, and some portions entirely decayed; two of them, however, were secured in tolerably good condition, one containing thirty-two sound teeth, the other wanting but two or three. Many teeth were found with fragments of decayed jaw-bones, and it is very evident that, whatever the troubles and trials to which their possessors were subject, that plague of modern times, the tooth-ache, was one from which they were pretty much exempt.

The crania have apparently been subjected in life to no artificial distortion nor compression, except, possibly, some flattening of the occipital region, such as is said to be produced by the position and manner in which some tribes confine the infant to a cradle-board. The heavy, superciliary ridge, retreating forehead, and protruding and wide jaws, with the great bi-mastoid diameter as compared with the bi-parietal, are indicative of physical rather than of mental or moral capacity.

As portions of all parts of the skeleton are found, it would appear that the whole of each has been deposited there, though thrown in rather "promiscuously". The heads were all lying in the same direction, southward, in some cases in contact with each other, and the other parts so intermingled and decomposed as to make it impossible to trace any one skeleton, or to determine to which one an individual bone belonged.

Many of the small bones and the softer portions of the larger ones, are entirely gone. The best preserved skeleton, (skull No. 3, PL. XX.), was lying stretched out in a horizontal position, with the face upward and was a few inches above the rest, and of those which were piled in together, one was lying on its right side.

The sand below, above, and around the bones presents the same uniform appearance, from a yellowish-gray to a reddish-brown color, except that that immediately about them is usually a little darker, and occasional irregular and uneven streaks of rather darker sand are found, as if some loads or parcels of the earth of which the heap is formed, had been partly of a dirtier surface soil, and had been thrown scattering over the surface, and then covered with cleaner sand. A few of the most southern mounds, where the earth is gravelly, are composed of sand and gravel showing that, as in other cases, they are built of the material nearest at hand.

It would appear that the process of interment had been a very simple one, viz: selecting a spot where the earth was loose, sandy, and easily removed; scraping away to the depth of a foot or two, then, carelessly depositing a number of bodies, or rather perhaps of skeletons, collected, possibly, from elevated scaffolds, trees, or other positions where the bodies had been previously placed; then replacing the sand which had been removed, and adding enough from the surrounding surface to raise a heap of such dimensions as their inclination to manual labor and their respect for the deceased would prompt. The

position of the skeletons is a pretty certain indication that the bodies were not interred one at a time, as that could not have been done without in each instance entirely uncovering these previously buried, the skulls being in some cases in contact with each other.

In this mound no relics, weapons or implements were found, except a very small fragment of pottery in the earth, about a foot from the surface, and an arrow-head of very peculiar form, (fig. I, Pl. X.) which was lying among the bones.

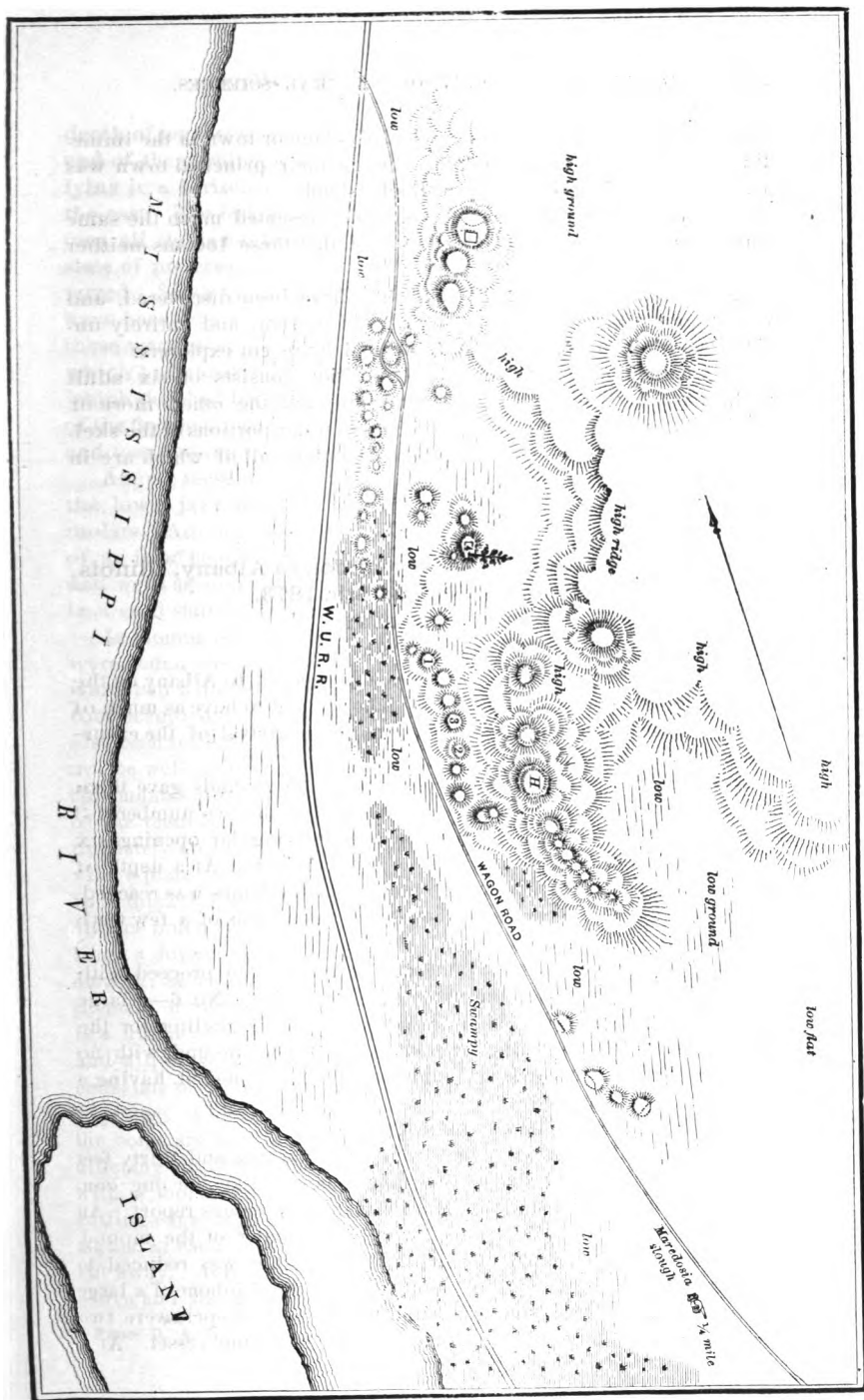
In one of the largest mounds (W) about twelve feet high and standing on the highest ground, opened some years since, was discovered an inclosure of "dry wall" some ten feet square, containing a number of skeletons supposed to have been buried in a sitting posture, with no indication of any covering or floor having ever been there, save the earth of which the whole mound was composed. A portion of this wall which still remained exposed, we carefully removed for examination, and found it to be built of the fossiliferous limestone common in that locality, brought probably from near the river bank, a quarter of a mile distant, and a hundred feet lower; laid up with tolerable evenness on the inner side. It was about three feet high, two feet thick at the top, and three at the base, piled up loosely, the lower stones broad and flat, rather heavier than one man could well carry, and lying on the clean, yellowish sand. Some of the stones had been burned red previously to being placed in the wall. This inclosure was entirely at one side of the center of the mound, and nothing of interest was found in the other part.

Many of the mounds have been opened and partially explored by citizens and strangers in search of "curiosities," and of late such visits are more frequent than ever.

Some estimate of the original maximum height of these *tumuli* may be formed from the observation that sandy earth, such as that of which they are composed, will not remain in position on a slope of more than forty degrees from the horizontal; they could not, therefore, have been higher, even if raised to a point at the apex, than two-fifths of the width at the base, and the very first rain or wind would reduce them considerably. As they are now, however, they would probably remain with contour unchanged by the action of the elements for a thousand years to come.

This region has long been occupied by the tribe of Indians known as the Sacs and Foxes, who came from the region of the Saint Lawrence over two hundred years ago, and remained until about the period of the Black Hawk war, about 1832.

George L. Davenport, Esq., of this city, who was born on the island of Rock Island, in 1817, and was the first white child born in this section of the country, and who has been intimately acquainted with the Indians for over fifty years, and speaks their language, informs us that they had positively no knowledge of these structures, and paid no



attention whatever to them. They had a village or town in the immediate neighborhood of the mounds, though their principal town was near the site of the present city of Rock Island.

It is therefore certain that the mounds presented much the same appearance many years since as now, and that these Indians neither constructed nor used them.

No evidences of "intrusive burials" have been discovered, and without doubt the mounds have been as at present, and entirely undisturbed for many centuries, until opened by recent explorers.

The collection secured in this expedition consists of six adult skulls, two of which are in good condition, and the others more or less broken or wasted, many of the bones of other portions of the skeletons, one arrow head, and a fragment of pottery, all of which are in the cabinet of the Academy.

Report on the Results of the Excursion to Albany, Illinois, November 7th and 8th, 1873.

BY A. S. TIFFANY

[Read November 28th, 1873.]

At the request of several Trustees I proceeded to Albany on the morning of November 7th, to procure laborers and to have as much of the heavy work done as possible previous to the arrival of the excursion on the following day.

I procured two laborers, and proceeding to the mounds gave them a hasty inspection, and decided to commence on the two numbered 3 and 4 on Mr. Pratt's chart. I marked out a rectangular opening, six by seven feet over the central part of both mounds. At a depth of five and one half feet, in No. 4, the horizon of the bones was reached. A few fragments of decomposed bones and the crowns of a few teeth were all that rewarded the labor.

On the next day I directed one of the laborers to proceed with mound No. 3, while with the other one I examined No. 6—a large double mound which had been partially removed in grading for the W. U. R. R. After spending an hour's time on this mound, with no indications of either bones or implements, I abandoned it, having a strong desire to explore the

OAK TREE MOUND, NO 5.

This mound is about sixty feet from north to south and thirty feet across. The form and size of this mound is very like the one containing the wall described by Mr. Pratt in his previous report. An opening was begun ten by five feet, west of the center of the mound, but the time being limited, at a depth of five feet it was reduced to five feet square. At a depth of about two feet, the shinbone of a large animal, probably the Bison, was found, and a little deeper, were two specimens of pottery evidently belonging to the same vessel. At a

depth of ten feet was a row of limestones east and west near the north end of the opening, and immediately south of them a large skeleton, lying in a horizontal position, with the face upward and head toward the east. The feet were turned outward. With the exception of the toes, all the bones of the lower extremities were perfect and in a fair state of preservation, and had not been disturbed since they were interred. South of the above was another skeleton, which seemed to have been interred at the same time and in the same manner. Above these were several skeletons in a less perfect state of preservation, which had apparently been interred at a later period. The order in which they had been laid could not be determined. Most of the bones of the first mentioned individual were obtained perfect except the hands and toes, the skull is very good, including the cheek and nasal bones.

Among these remains were several pieces of pottery and a piece of the lower jaw, probably belonging to the deer or elk, containing five molars. Also a *Union* shell, nicked on both edges, about three-fourths of an inch below the beak, so that it could be suspended by a cord and worn as an ornament. Three skulls were obtained in this mound in a good state of preservation.

In mound No 3, at the depth of six or eight feet from the surface, were found the skeletons of four adults, lying stretched out, face upward, two with heads toward the east and two toward the west. The four occupied a space of about four feet in width. Two children had also been buried there, perhaps at a later date, but their position could not be well ascertained. One of the skulls, (Plate XXI, No. 5) from this mound, was obtained in a very perfect condition, except that most of the teeth are wanting. In this mound were discovered, lying immediately above the skeletons, several relics of considerable interest, viz.: a plate of mica, about three by four inches and one-eighth of an inch thick, with several notches in the edges; a small lump of galena, surface much carbonized, and the corners worn, apparently by handling; a dove-colored flint arrow-head, very finely wrought, sharp and smooth; several flakes of white flint, and a strangely-formed bone-implement or charm, or whatever it may have been, (Pl. VII, Fig. 1.) It is a fragment of a marrow-bone, four and a half inches long, and one and a quarter wide at the middle, tapering nearly to a point at the ends, one of which is more pointed than the other, and much curved edgewise. Close to the edge, at the convex side, at the widest part of the bone, are four holes, about one-eighth of an inch in diameter, but differing slightly. They have the appearance of having been drilled with a tool not much, if at all, tapering in form, and with a square cutting-edge, which was not worked entirely through, as there remains, in each hole, on the inner side, a little edge, which is not quite cut away. Across the bone, near the larger end, are two rows of holes—five and six in a row—one-tenth of an inch or less in depth, drilled

with some round-pointed instrument. One curved line is cut across, as shown in the figure. The article seems much worn by handling. What was its use we can scarcely conjecture, and some Indians (Sacs and Foxes) to whom it was shown, can give no clue.

All the mounds examined appear to be constructed of the materials which immediately surround them. In all the mounds explored by me, there were evidences of fire having been used in funeral ceremonies.

All of the skulls obtained belong to at most two types, and these differences may only be different ages or stages of development. The largest and heaviest skulls have a heavy projecting orbicular ridge the whole length of the brow, and the thinner skulls accompanied by smaller and lighter bones, have the orbicular ridge produced and projecting to a sharp edge towards the temporal bones. Both of these types have the orbits much less incurved under the orbicular ridge than in any of the more modern races inhabiting this region.

Report of Explorations of the Ancient Mounds at Toolesboro, Louisa County, Iowa.

BY W. H. PRATT.

[Read September 4th, 1875.]

Our little party, consisting of Mr. Charles E. Harrison, my son and myself, having, on a recent exploring expedition, spent five days among the ancient mounds in Louisa Co., Iowa, I would respectfully present the following description of the same, and report of operations.

The group consists of twelve mounds, and is situated on the edge of the bluff over-looking the Iowa River bottom, two and a half miles from the mouth of the river, at the village of Toolesboro, in a position commanding a good view of New Boston, which lies three miles distant, on the opposite bank of the Mississippi. The city of Muscatine can also be seen, at an air-line distance of twenty-one miles. There is another group of six or seven mounds, about three-quarters of a mile up the river, southward. These we did not disturb.

The mounds are from six to ten feet above the natural grade, and from forty to eighty feet in diameter, and are composed of a very hard earth, a mixture of clay and black soil, such as the clay of the immediately adjacent hill-side and the soil of the prairie on which the mounds stand. They are, of course, burial mounds, but the bones are usually not very numerous, and are very poorly preserved.

The most of them contain considerable quantities of oak wood, in logs six or eight inches or more in diameter, placed at and near the bottom of the mound and very much decayed. Immediately beneath these logs the bones were frequently found.

Two of the mounds were opened with pick and spade, making an excavation about six by nine feet to the original surface level, and then "drifting" in different directions where the indications seemed most encouraging.

In the first nothing was found excepting a few flint chips and scattering human bones, which were sufficient, however, to show that it was a burial-place.

In the second was a great quantity of the decayed wood, at different levels, from six to nine feet below the surface of the mound.

These logs were laid without any arrangement whatever, so far as we could discover, as if thrown in at random, except that, as above mentioned, the skeletons were oftener found beneath the wood than elsewhere. Portions of several skeletons were found in this mound, among them was the skull of a child, but all were so decayed that it was impossible to preserve a skull which could be restored to any considerable extent.

Near one of the skulls was a neatly carved pipe, of gray pipe-stone, (Pl. IV, Fig. 18) representing a bird, and furnished with eyes of pure native copper, which, doubtless, had answered all purposes to the satisfaction of the artist.

Here was also a copper "awl", about six inches long, hammered square instead of round, and bent at right angles and flattened near one end, (Pl. VI, Fig. 5).

When these discoveries had been made and further search in this mound seemed unpromising, a number of the citizens volunteered their assistance with teams, to open another mound for the benefit of the Academy. This kind offer we gladly accepted, and with five teams and plenty of men, a third mound was soon scooped out, more thoroughly than either of the others had been by hand.

A more particular description of this mound may be of interest. It was composed, as before mentioned, of a mixed earth, with scarcely any gravel or stones of any kind. The large sticks of wood were found near the base and lying in irregular positions, showing no connection or general plan whatever. There were many irregular layers, generally of small extent, scarcely more than one-tenth of an inch in thickness, of what appeared very much like white ashes, but whose real nature is difficult to determine, as there was no charcoal or other substance found associated with it, to aid in the explanation, except that such a layer was usually found in contact with the wood on the under side.

It may have been composed of lime from river shells, which had been burned; but such a supposition would be mere conjecture.

The floor on which this mound was built, is a firm, hard, light-colored clay; is, in fact, apparently the original undisturbed earth of this locality, (the edge of the bluff) and stripped of its covering of dark soil, if it ever had any. This was covered first with a layer about one

inch in thickness, of very tough, yellow clay, slightly moist and of about the consistency of stiff putty.

Lying directly upon this clay, were found the bones, implements, etc. This clay floor was entirely wanting in the other two mounds.

Here were found portions of two or three skeletons, so imperfectly preserved as scarcely to bear removing without falling entirely in pieces.

The first object of especial interest unearthed here, was a large marine shell—*Cassia Madagascarensis*—which was secured with only a slight fracture by the pick-axe. This shell measures $7\frac{1}{2}$ by $10\frac{1}{2}$ inches, and holds about five and a half pints, and as the internal whorls are all cut out, it was probably used for holding water.

With this, and near one of the skulls, were large earthen vessels, or parts of them, for it seems certain that, while there were portions of at least four, there had not been placed there the whole of any one. The pottery was crushed entirely out of shape, and was very friable, and difficult to detach from the very tenacious clay, without crumbling into the smallest fragments. We however took much pains to secure it all, in the hope of being able to restore the vessels at least in part, to their original form. These had contained some river shells, only small fragments of which could be distinguished, and a quantity of the white powder above mentioned.

A few feet from this was another skuli and other portions of the skeleton, and near the head, as if it had been laid upon the chest, was a very smoothly wrought copper axe, (Pl. V, fig. 16,) showing very distinct traces of the cloth in which it had been wrapped, and some portions of which were still adhering to the copper. About the neck and inside of the skull were some two hundred shell beads rather poorly preserved. A few feet of further excavation discovered two carved stone pipes representing birds, Nos. 14 and 15, one of which, No. 15 was of red pipe stone which is rather unusual, and furnished with eyes of pearl. These eyes, as well as a portion of the beads above mentioned, are made of the pearls which are occasionally found in some species of the *Unios* of the Mississippi. Also in close proximity to these were three more copper axes, Nos. 14, 17, 18. Excepting the red stone pipe, 15—which, though belonging to the Academy, is at present retained by a person at Toolesboro—all the above articles are now in the Academy collection; as are also one copper axe, No. 15, and one copper awl and several small sand stone implements, perhaps scouring or polishing stones, which had been found a few days previous by Mr. Freeman Shaw, and which were kindly donated by him to the Academy.

The mound from which these last mentioned articles came, had not long since been enclosed and used as a hog-pen; and being on the extreme edge of the bluff at a very steep declivity, the digging and washing away of the earth exposed some of the relics to view, and a little search revealed the rest. We explored the remaining portion of this mound to some extent, but found nothing more.

About a quarter of a mile north-west of the above described mounds is what is familiarly known as "the old fort ground."

This is described by Hon. Wm. Toole, who has resided there about forty years, as having consisted of an earth-work enclosing an area of fifteen or twenty acres, of an octagonal form, the sides being curved and convex toward the inner side. The embankment was in those days some two feet in height, but is now pretty much obliterated, the ground having been under cultivation for many years.

This space, on which a heavy crop of corn is now growing, is thickly strewn with flint chips and fragments of pottery. In a search of three or four hours, we picked up fifty or more flint implements consisting in part of small arrow heads and "darts," (triangular and without notches or barbs,) but mostly of a well defined form, and well worked plano-convex instruments, the use of which is, so far as we have yet learned, not at all understood.

These are from one inch to two inches in length, about half as wide, and one-fourth of an inch, more or less in thickness, rounded in outline at each end, but one end considerably more tapered than the other, and in some cases rather pointed. They are very much in the form of a flat-iron without the handle. (Fig. 4, Pl. VII), represents the convex side of one of them, 4a side view of same.)

The pottery seems to be of a somewhat different character from that found in the mounds; more gray in color, and composed of earth mixed with a small portion of pounded shells. Among these fragments are frequently found the broken *handles* of the vessels, of which we do not know of any having been found in the mounds in this part of the country.

One flint arrow head only was found in each of the mounds from which the other articles were taken.

On our way down the river, we spent a day in working out one of a small group of

MOUNDS NEAR PINE CREEK,

on the edge of the bluff, on Mr. Lowry's farm, about 18 miles below this city.

Nothing of especial interest was observable in the structure of this mound, except the occurrence of a considerable quantity of charcoal, in fine fragments, which was scattered through it, as if mixed with the earth of which the mound was composed, before it was placed there. No ashes were to be seen.

At the depth of seven feet was found the frontal portion of a human skull, which is shown on Pl. VII, fig. 9, reduced one-half.

It is the remainder of a skull from which a number of circular pieces have been cut, whether for "charms" or for some other purpose, of course we cannot tell. They were apparently *sawed* out with some rude instrument, the circular cuts made in sawing out seven

such pieces being very distinctly shown. The rest of the missing portion of the skull has no doubt been used up in the same way.

This bone is also remarkably well preserved, which would probably indicate that it had been long kept, and thoroughly dried before being buried.*

No other bones were found in this mound, except a few scattering fragments within two or three feet of the surface, and no weapons nor relics of any kind whatever except a single small shell bead which was found at the depth of about six feet, and which was doubtless accidentally dropped there.

QUERY.—Was this mound constructed for the sole purpose of preserving and honoring this fragment of a human skull.

POSTSCRIPT.—OCTOBER 1875.

Having learned that some further explorations of the mounds at Toolesboro had recently been made by the citizens of that place, I went thither, in the interest of the Academy, to learn what discoveries had been the reward of their labors, and to examine the mounds which had been opened.

I found that they had excavated four of those alluded to in my previous report as existing about three-fourths of a mile to the south of those we opened last August.

Like the others, they are situated along the edge of the bluff overlooking the Iowa River, and this locality is covered with a scattering growth of oaks, six or eight inches in diameter, whose roots interfere considerably in the work of excavation. The land is owned by J. J. Parsons, Esq., who joined with Messrs. Joshua Sowash, George Shaw Chas. Melrose, Wm. S. Hobbs, Wm. Shafer, and Wm. Patterson in the exploration which occupied six men and three teams for five days.

These mounds were similar in structure and appearance to those previously explored and described.

The largest mound, and first opened, of this group, was about eight feet high and forty in diameter, and in excavating it, which was done principally with plow and scraper, they removed about 140 cubic yards of earth, leaving a small portion on two sides undisturbed.

At the bottom of this mound was found a thin layer of sand, which was at or about the natural grade of the original surface.

On this floor were discovered a copper "axe", weighing almost exactly two and a half lbs., the largest we have seen, and of different form, as shown at Pl. V. Fig. 19. Also a thin, flat bone instrument, having a hole in it as if for a string to suspend it by, and supposed to have been used as a knife, though it scarcely could have been a very sharp one, (figured at Pl. VII, Fig. 6, $\frac{1}{2}$ size) and several round stones, and portions of several skeletons.

The next mound opened was of about half the size of the first and

*For a discussion of the subject of relics of this character, see "Cranial Amulets," by Dr. J. Bertillon, in the Popular Science Monthly, of September, 1875.

contained no indications of a floor of any kind. Here were found five copper "awls"—figured on Plate VI, one copper axe, (No. 20, Pl. V,) flat on both sides, and with square edges; a carved pipe of mottled red pipe-stone, and representing a panther or lynx—(No. 11, Pl. IV,) several flint arrows, and a large lump of galena.

In the third, which was also a small mound, was a considerable quantity of pottery, hopelessly broken up, and a number of pieces of horn several inches in length, one and a quarter inches in diameter and rounded over one end as if used as a pestle, (fig. 4, Pl. VII), formed probably from the horns of the elk.

The fourth mound, which was about five or six feet high, and twenty-five by fifty in diameter, contained a great quantity of human bones, from within two and a half feet down to the depth of six feet from the surface, but no skulls were secured, as all were very fragile and much crumbled. From all the data accessible, I could form no estimate of the probable number of skeletons buried there.

From this mound was taken an unfinished pipe, (No. 12, Pl. IV), of a soft whitish stone, probably unfit for the purpose, and perhaps abandoned on that account.

Several of the horn implements like those in the third mound were also found here.

All these articles were kindly donated to the Academy by the seven gentlemen above mentioned, and are now in its collection.

Mound Explorations in 1875.

BY CLARENCE LINDLEY.

On the north side of Rock River, opposite the town of Milan, Rock Island, Illinois, and on a high ridge, one fourth of a mile from the river, is a group of mounds arranged in two rows, meeting at right angles like the letter T. This arrangement was probably the result of the configuration of the ridge. Late in the spring, in company with several others, I explored one of this group. The mound examined was 9 feet 7 inches high and about 30 feet wide at the base. The soil of which it was composed, was principally yellow clay. Near the surface we found several very large flat stones, lying on their flat sides. There was nothing of particular interest in this mound, unless it was the position of the bodies—which, as near as we could detect, were, without exception, with the head west and the feet east.

On this same ridge, near the famous Black Hawk's Tower, is a lone mound, removed from all other groups. Its dimensions were about the same as the above, and dense woods surround and cover it. There was one tree at least $2\frac{1}{2}$ feet in circumference growing on its very summit. We found that this mound also contained surface stones of large dimensions. One in particular we noticed was four feet long

and almost three feet wide. The bodies were found on the floor of the mound and occupied the same position as those first examined. Between the broken pieces of one of the skulls we found a very sharp-pointed arrow head.

About a quarter of a mile from the lone mound, on the same ridge, is a group of mounds, thirty-seven in number. We opened two of these. They both contained flat surface stones. The soil of one was so dry that the wind blew large quantities of it away. Intermingled with this dry soil was charcoal. When we came to the bodies, they were all disfigured by fire, the edges of the fragments of skulls being in part charcoal. Neither were the bones in the same position as in the other mounds.

At the foot of this ridge, near the river, are three groups of mounds. We examined the group farthest down the river. This group contains four mounds. They are on a slight elevation, within ten yards of the river. The soil of these was black loam, mixed with clam shells (*Unio*, etc.) They all contained surface stones, though not of such large dimensions as those on the hill. We first examined the mound farthest up the river. The bodies were found in the same position as in the first-described mounds, with the exception of the remains of an infant, which lay north-west and south-east. The next mound we did not examine. (It was afterwards explored by Mr. Tiffany.)

Directly under the surface stones of the third mound, of this group we found three skeletons, with an arrow-head among the rib bones of each one. Four feet below these bodies were some more stones, and under these stones were four skeletons.

The fourth mound was the most interesting of this group. This mound, as well as the others was about six feet high and thirty five feet across the base. When we reached the floor of the mound we found five skeletons all stretched out east and west. The middle one was somewhat larger in frame than the others and the arms were stretched out nearly to full length. Near the fingers of the right hand was a flint spear head five inches long, and twenty-one arrow-heads. At the feet was an earthen vase; near the shoulders and breastbone were two polished stones, about six inches long. By the side of one jaw-bone was a small boulder with one side polished. Near the other jaw-bone, and a little higher up, was a piece of worked deer-bone resembling a knife-handle, near this knife-handle were several bones of some animal, and the jaw-bone of a deer.

In Muscatine County, Iowa, two miles above Pine Creek, on a very high ridge is a group of mounds six in number. One that we opened was composed of yellow clay. There were no surface stones, but we found river shells and some charcoal. The position of the bodies was east and west as in the mounds on Rock River. We found forty-one beads among the remains.

On the slope of this ridge is another group of mounds forming an irregular circle. We opened one of these mounds which was about fifteen feet high and one hundred feet wide at its base. We found no stones on the surface, but about four feet below there were two layers of flat stones. Between two of these large stones, and in a cavity of the lower one, we found a large jet black arrow-head. There was a broken skull in this mound the thickness of which was at least half an inch. One of the leg bones was notched as though it had been repeatedly struck with some sharp instrument.

About half a mile below Pine Creek is another group of mounds, about fifteen in number, all on a high ridge. One of them is almost twenty feet high. A little north of this mound are two elongated mounds about four feet high, five feet wide, and twenty feet long. We opened one of the conical mounds. No surface stones were found, but within two feet of the surface was two-thirds of an earthen vase. After digging fourteen feet we found the remains of six persons. They were arranged converging around a large sea-shell, (*Cassia Madagascarensis*), the feet all being inward next the shell, and the heads outward.

We examined two mounds in Whiteside County, Ill., on the Mississippi river, opposite Clinton, Iowa. The soil was sandy. The bodies were almost entirely decayed and were lying north and south. In one of the mounds we found a skinning knife, of stone.

Mound Explorations in 1875.

BY A. S. TIFFANY.

APRIL.

1st. Explored a mound on Capt. Hall's place, near Davenport, assisted by Messrs. Pratt and Hume. Two days' work resulted in a copper axe, covered with cloth, a stone pipe, four arrow-heads, one worked bone and a broken crock.

2d. Made further explorations at the Cremation Mound described on page 64, assisted by S. P. Stevens, Esq. with satisfactory results in regard to construction.

3d. Explored mound in Buffalo Township, assisted by S. P. Stevens, Esq. This mound has been worked in many years ago. We found a small wheel, like a pulley wheel, made of burned clay and pounded shells, (Pl. VIII, fig. 5.) a stone pipe of red pipe-stone, [Pl. fig. 6,] three sea shells, (*Cassia Madagascarensis*) nearly decomposed, as were also the bones.

4th. In a mound at Gilbert found one arrow-head.

5th. Explored two mounds in Rockingham, assisted by Messrs. Stevens, Pratt and Lindley. We found only the decomposed bones of about twelve individuals in each mound.

MAY.

6th. Examined two mounds in Shabney Grove, Henry Co., Ill., assisted by F. Luckett, finding a small flint knife. Two cremation mounds previously explored were again examined. One has had burials since the burning.

JUNE.

7th. Explored a mound in Moline Township, assisted by C. Lindley and G. W. French. Found only decomposed bones.

8th. Examined another mound in the same group, assisted by Mr. Lindley, finding a stone axe with the decomposed bones.

9th. Explored two more mounds in Shabney Grove, Ill., assisted by F. Luckett, finding four good skulls.

10th. Spent two days exploring one mound on Rock River, assisted by G. W. French, finding a stone pipe, four skulls, a broken crock, etc.

11th. Examined two more mounds in the same locality and with the same assistance, finding 22 stone net sinkers and six skulls.

JULY.

12th. Explored a mound near the mouth of Rock River, assisted by S. F. Gilman, finding only decomposed bones.

AUGUST.

13th. Spent four days exploring three mounds at Albany, Ill., with two hired assistants. We found sixty shell beads, one skull, two marine shells (*Uassis Madagascarensis*), too much decomposed to bear handling, and a broken crock.

SEPTEMBER.

14th. Examined a mound near Green River, Henry Co., Ill., assisted by F. Luckett, finding nothing.

NOVEMBER.

15th. Explored another mound in Shabney Grove with F. Luckett, finding decomposed bones—the remains of many interments.

DECEMBER.

16th. Explored a mound in Gilbert, finding an arrow-head and flint chips.

17th. Explored a mound near the mouth of Duck Creek, assisted by S. P. Stevens, Esq. There had been fifteen interments, two lower jaws and the molar tooth of a buffalo were obtained.

A Study of Skulls and Long Bones from Mounds near Albany, Ill.

BY R. J. FARQUHARSON, M. D.,

[Read before the Academy January 28th, 1874.]

This lot of bones was obtained from mounds near Albany, Ill. The topography, &c., of these mounds is given in a preceding paper by Mr. Pratt, who conducted the explorations.

In the first place, an attempt was made by a rude analysis to arrive

at the probable age of the bones. A small part of the middle portion of one of the long bones was incinerated, with the following result: Weight before incineration, thirty-eight grains; afterward, thirty grains; loss, eight grains; equal to 20 per cent.

	Mineral matter.	Animal matter.
Fresh bone, (dry,) Berzelius.....	67	33
Mound-builder's bone.....	79	21
	—	—
	12	12

Now, as the lightness, or diminished specific gravity of these bones, precludes the idea of an increase of the mineral matter, and also as we know that, in certain conditions of soil, an actual loss of mineral matter takes place, we may safely infer that a considerable loss of animal matter has here taken place; a loss even greater than what the above figures would seem to indicate.

But, unfortunately, these data will not afford even an approximate estimate as to the time since these bones were buried.

"In an old Roman frontal bone dug up from Pompeii, Dr. Davy found 35.5 animal parts, and 64.5 earthy; and in the tooth of the mammoth 30.5 animal, and 69.5 earthy." (Todd and Bowman's Anatomy, vol. 1, p. 105.)

Orfila, in his *Exhumations Juridiques*, (vol. 1, p. 350,) states that bones buried in the cemetery of the Innocents, Paris, over six hundred years, yielded, in analysis, 27 per cent. of gelatin and 10 per cent of fat; while fresh ones yielded only 30 per cent. of gelatin, showing only a slight alteration. On the other hand, bones exhumed from the church-yard of Ste. Geneviève, Paris, after a burial of over seven hundred years, showed marked alteration, which he describes as follows: Very brittle, of a purplish color; remarkable both for the absence of animal matter and for the presence of the acid phosphate of lime. Unfortunately, no analysis of these changed bones is given.

TABLE NO. 1.—The plan of this table is taken from Foster's work on the prehistoric races of the United States, and the letters at the heads of the columns refer to the same measurements. Four other columns are, however, added, the first giving the capacities in cubic inches; an important point omitted by Foster, probably from the fragmentary nature of the skulls in his possession. The second and third added columns give the distance of the occipital protuberance from the posterior margin of the *foramen magnum* and the ratio of this distance to the long diameter of the skull. This is an important characteristic of the mound-builder race, according to Dr. Wyman.

The fourth and last column gives the major and minor axes of the *foramen magnum* in millimeters.

TABLE No. 1.

Base of skull.	Condition.	*A	*B	*C	*D	*E	*F		Capacity in cubic inches.	Distance of occ. prot. from for. mag. in inches.	Ratio of distance to long diameter	Size of for. mag. millimeters
							Br. (mastoid.)	Br. (parietal.)				
I. M-b.	Imp	21.5	12	10	4.1	8	5	4.8	72.75			
II. M-b.	Per	19	12	10	4.125	8.5	5.5	5.1	72.75	2	0.307	80x28
III. M-b.	do.	19.5	11.5	9	3.5	8.6	5.5	5.1	62.35	2.3	0.348	39x32
IV. M-b.	Imp	19	11	8	3.5	6	6	5.6				
V. M-b.	Per	20	11.5	9.5	3.9	8.6	5.6	5	81.40	2.4	0.363	36x32
VI. M-b.	Imp	20	12.5	....	4.5	6.5	....	6				
VII. Sx	Per	20.5	12.5	10	3.5	7.1	5.1	5.1	80.53	1.9	0.297	42x35
VIII. Sx	do.	21	12	10.5	4	7.125	5.5	5.1	76.20	2.2	0.310	40x31
IX. Sx	do.	20	11.5	9	3	7	4.8	5.125	76.20	2.1	0.300	38x35
X. Av md-b.		19.8	11.7	9.3	3.93	6.7	5.6	5.1	72.31	2.2	0.338	+1132
XI. Av Sx...		20.5	12	9.8	3.50	7.03	5.1	5.1	77.64	2.0	0.284	+1337

†Square millimeters.

REMARKS.

- I. Capacity approximate, from imperfection. Ratio of short and long diameters, 0.80 to 0.625.
- II. Ratio of short and long diameters, 0.846 to 0.784.
- III. Skull, thick, and heavy, from former disease. Ratio of short and long diameters, 0.833 to 0.772.
- IV. Ratio of short and long diameters, 1 to 0.933.
- V. Aged—molars all gone and alveoli absorbed. Ratio of short and long diameters, 0.843 to 0.757.
- VI. Ratio of short and long diameters, 0.923 to 0.923.
- VII. Ratio of short and long diameters, 0.718 to 0.718.
- VIII. Ratio of short and long diameters, 0.771 to 0.715.
- IX. Ratio of short and long diameters, 0.635 to 0.732.
- X. Ratio of short and long diameters, 0.836 to 0.761.
- XI. Ratio of short and long diameters, 0.725 to 0.725.

*A. The horizontal circumference in the plane of a line joining the glabella with the occipital protuberance.

*B. The longitudinal arc from the nasal depression along the middle line of the skull to the occipital tuberosity.

*C. From the level of the glabella-occipital line on each side, across the middle of the sagittal suture to the same point on the opposite side.

*D. The vertical height from the glabella-occipital line.

*E. The extreme longitudinal measurement.

*F. The extreme transverse measurement.

TABLE No. 2.—In this table an attempt is made (by means of another table of the comparative lengths of the various long bones in a series of skeletons, given in Orfila's *Exhumations Juridiques*) to arrive at some idea of the stature of the mound-builders, but the conclusions are very imperfect, perhaps necessarily so. Enough was learned, however, to safely warrant the conclusion that none of the bones examined belonged to an individual much, if any, higher than six feet, thus doing away with the assumption, made by some persons at the time of the exhumation, that some of the mound-builders were giants.

TABLE NO. 2.—*Stature estimated from length of bones.*

Race.	Bone.	Length in cen- timeters.	Major axis in mill- imeters.	Minor axis in mill- imeters.	Estimated length of skeleton in meters.	Height of man in feet and inches. (1)	Remarks.
Mound-builder,	Femur	46	30	29	1.77	5.11	Neck of femur long and not oblique.
Mound-builder, ...do...		45½	30	28	1.71	5.09	
Sioux.....do.....		45	33	29	1.67	5.07	Belongs to Sioux skull, No. 2.
Mound-builder, Tibia.....		32	33	22	1.49	5.00	
Mound-builder, ...do.....		(2)	38	23	.....	.....	A fragment, upper half.
Sioux.....do.....		38	36	28	1.69	5.08	Belongs to Sioux skull, No. 2.
Mound-builder, Humerus		33	.....	(3)	1.80	6.00	
Mound-builder, ...do.....		34	.....	.....	1.88	6.02	
Mound-builder, ...do.....		33	.....	(3)	1.80	6.00	
Mound-builder, ...do.....		31	.....	.....	1.87	5.07	
Sioux.....do.....		38	.....	(3)	1.80	6.00	Belongs to Sioux skull, No. 2.

1. The total length of the body is made out by adding two inches to that of the skeleton.

2. These diameters, taken near the middle of the length of the tibia, and at its most prominent part, show its flatness and the comparative sharpness of the shin-bones.

3. From an average of five skeletons in the table having a humerus measuring 33 centimeters. Here it may be remarked that in the French table there is a greater disparity in the height of the skeleton, in regard to the humerus, than either to the femur or tibia, one skeleton of 1.86 meters having a humerus of only 33 centimeters.

The skulls and long bones of the modern Indians used in the comparative measurements in these tables, were those of male Sioux Indians from Minnesota, who died in this vicinity, while in captivity on account of their complicity with the massacre in that State, so that there can be no doubt of their identity.

It only remains to remark, in conclusion, that an unusual number of perfect sets of teeth were found in the mounds examined. These teeth are invariably without any signs of decay, of almost flinty hardness, and very much worn away, apparently from the attrition of very hard particles in the food, probably the siliceous outer coats of some kind of grain or seeds.

Recent Archaeological Discoveries at Davenport, Iowa, of Copper Axes, Cloth, etc., Supposed to have come down to us from a Pre-Historic People, called the Mound-Builders.

BY R. J. FARQUHARSON, M. D.

[Read April 9th, 1875.]

The subject I have chosen for a paper to-night, is that of the copper relics and specimens of cloth, supposed to have come down to us from a pre-historic people, called the Mound-builders.

These specimens, of great, and in the case of the cloth, I might add, of unique value, in an archaeological view, are now on the shelves of our little museum, through the generous liberality of the Reverend Mr. Gass, and of Mr. Smith.

Though somewhat familiar to many of you, it may perhaps be advisable to freshen your memories again, by some mention of the details of this rich and remarkable archaeological find. The following is taken partly from personal observation on the spot, but mainly from the account of the matter, furnished the daily papers by Mr. Gass.

SITE OF THE MOUNDS, (Plate I.)

This is well shown by the accompanying map, for which I am indebted to the kindness of Mr. W. H. Pratt, a member of our academy, and a most diligent worker in this and kindred branches of natural science. The mounds are situated about one mile below the city of Davenport, on the immediate bank of the Mississippi River, having a general bearing of N. E. and S. W., or nearly parallel to the course of the river at this point, and distant, from high water mark, 250 feet. As will be seen by the map, all these mounds are placed on a strip of ground whose average surface is only 8 to 12 feet above high water mark, thus disproving the assertion of a late writer (Mr. Alexander Delmar, in the *Independent* of May 20, 1875) that, "when the Mound-builders inhabited the Mississippi Valley, the deep alluvial deposits of rich black mold, which now renders that section of the country so fruitful, did not exist"; and also the older one of Squier's, that "none of these works (the mounds) occur in the lowest forms of the river terraces, which mark the subsidence of the western streams,....while they raised them promiscuously on all the others."

MOUND NO. 1. (Plate II, Fig. 1).

The first or upper mound, (a single mound, though apparently double on the surface) had a diameter of thirty and a height of four or five feet.

The layers, from above downward, are, 1st, a foot of earth; then a layer of stones, one and a half feet thick, [these stones came from the river and were nicely joined]; then a layer of shells, two inches thick; then a foot of earth; then, finally, a second layer of shells four inches thick; immediately under which [*i. e.* at the depth of five feet] the skeletons, all of adults, five in number were found.

The skeletons were lying in a horizontal position, parallel and near together; three lay from E. to W. and so that the skull of one rested upon the shoulder [*i. e. en échelon*] of the next; the fourth and fifth lay in the opposite direction, the heads to the W. and the feet to the E. [Plate II, Fig. 1].

With the first three, or those with the heads to the E., no relics were found; while with the last two, or those with heads to the W. all the following interesting objects were found:—1st, a large sea-shell.

[*Pyrula perversa*] with the axis and inner whorls removed: 2d, two copper axes, Nos. 6 and 8 [Plate V, Figs. 6 and 8,] very nearly alike in weight and form; they were found back to back [*i. e.* with the flat surfaces in contact], they were both covered with cloth, which was removed when the surface was unfortunately scraped, on the spot, by a knife; fragments of it, spared by the cleaning, being now visible; 3d, one copper awl; 4th, one flint arrow-head, and 5th, two pipes, one frog-pipe, [Plate IV, Fig. 5]. and one plain one.

The skeletons appeared, when first exposed, to be in a good state of preservation, but fell to pieces when removed.

MOUND NO. 2, (Plate II, Fig. 2).

This was about one hundred feet S. W. of the first, and like it in outward form and arrangement, but the interior was quite different, in having no layers of shells, but several layers of stones, with a few scattered shells; at a depth of five feet, eight skulls*, with some fragments of bones were unearthed; these were lying in a semi-circle of five feet diameter, and each skull was surrounded by a circle of stones, of the size of a small fist. From the position of the skulls and bones it was evident these eight bodies had been buried in a sitting posture. In this mound were found the following articles: 1st, two copper axes, Nos. 9 and 10, [Plate V, Figs. 9 and 10]; two small hemispheres of copper: also one of silver, probably ear pendants, [Plate VI, Figs. 19, 20, 21]; 3d, one bear's canine tooth; 4th, an arrow-head; 5th, a mass of red pigment; and 6th, the bones of a small snake, [probably accidental.] From mound No. 2 came the two fragments of skulls.

MOUND NO. 3, (Plate II, Fig. 3).

This, the largest of the series, was one hundred and twenty feet S. W. of the last described.

Of this, the Rev. Mr. Gass (the explorer), says: "*The outer and inner arrangements were quite similar to the first.*" But his further description shows that it was not, no layers of stones, nor of shells being mentioned.

At a depth of one and a half feet were found two adult skeletons lying in a horizontal posture, from the freshness of the bones, and also of some oak wood covering them, as well as from the accompanying relics, glass beads, a fire-steel, a clay pipe, and a silver ear-ring—this was supposed to be an intrusive burial of late period. Two of the bones from these skeletons, a femur and a tibia, curiously mutilated with a sharp-edged instrument are preserved in the Museum of our Academy. Beneath these at a depth of six feet, and under a thin layer of ashes were found the bones of two adults, and of one young infant. The posture of the adults is not given by the explorer, nor their relation to the infant bones, these latter, however, were covered over with a great many copper beads of various shapes and sizes, [Plate VI, figs. 12, 13, 14, 15, 16, 17, 18,] and by them were dyed of a deep green color;

*Plate II, Fig. 2, the artist has drawn five instead of eight skulls and skeletons.

they were also surrounded by a circle of small red stones, arranged like the rays of the sun.

Besides the beads and stones were here found the following lot of articles, viz: 1st, five copper axes, Nos. 1, 2, 3, 4, 5, [Plate V, figs. 1, 2, 3, 4, 5,] all covered more or less with cloth. 2d. Two carved stone pipes, one plain, and one having the form of a ground-hog, [Pl. IV, fig. 4. 3d. Many teeth of animals, several canines of the bear, one with holes drilled and polished, Pl. VII, fig. 2,] the incisors of small gnawers, musk-rat, gopher, etc.; the enamel from the incisors of a large gnawer, probably the beaver. 4th. One arrow head, three broken pots, with bones of the river turtle adhering to the insides of the fragments. 5th. Two pieces of galena. 6th. Yellow pigment.

MOUND NO. 4, (Plate II, Fig. 4.)

This was two-hundred and fifty feet S. W. of the last, and of a simple structure, containing neither stone nor shell layers; at a depth of six feet, and under a layer of 6 inches of ashes, were found four adult skeletons lying close together, with which were no relics save one copper axe. *"In the earth, on which they lay, it could be distinctly seen that they had been enveloped in cloth or some woven material, and at a depth of four feet was a round heap or altar, three feet high, of stones nicely joined together."* As stated above, the only relic here found, was the copper axe, (No. 7, Pl. V).

MOUND NO. 5, (Plate III, Fig. 5).

This was distant one hundred feet W. from No. 1. In size and internal arrangement it much resembled No. 2—i. e. with no strata of shells, but several layers of stones, with loose shells between them.

After some five feet of stones, shells, and earth had been cleared away, a skeleton was unearthed, upon which was a six inch layer of hard clay. Upon closer examination it appeared, that the bones were the remains of two skeletons, for several ribs, and pieces of skull, and four thigh bones lay together in a little heap; and somewhat to one side of them were a few bones of the arm, some ribs, and a lower jaw. Three feet further to the N. W., and at the same level was a round heap of stones, about four feet high, like that found in No. 4, (Plate III, Fig. 5, A). On this lay two very strong thigh bones and three ribs, placed diagonally across each other. There were also a few bones leaning against the heap at one side. The stones were partly burned to lime, and all of them showed more or less the marks of fire, while the bones in the mound showed not the slightest trace of it. A few pieces of charcoal also were found by these stones, as in two previous mounds, and the heap was doubtless an altar of sacrifice.

Four or five feet to the S. of this altar was found a large quantity of the remains of human bones, in such complete confusion, as if they had been only scattered there. Three feet further S., under a six inch layer of shells, were found two broken pots, one arrow-head, a finely wrought stone pipe, and a few stone implements—whetstones.

Four feet further S. lay another skeleton, from E. to W., and six inches above its skull a copper axe, No. 11, (Plate V, fig. 11). In this mound, in addition, were found some animal teeth, incisors of small rodents, canine of the bear, and a circular piece of the human cranium, (Plate VII, fig. 8) one inch in diameter, from the squamous portion of the temporal bone, evidently the work of art and strangely recalling the rondelles of pre-historic trephining, exhibited in France, last summer

MOUND NO. 6, (Plate II, fig. 6.)

This was about one hundred feet S. W. of No. 5. It was smaller in circuit and lower than the others, it also contained fewer stones, but more shells than the others. The skeletons in this lay scarcely three and a half feet deep. Here again the bones of the same parts of the body, and of the limbs lay, often several feet apart. Those of only one skeleton (or at most two) lay in natural order. There may have been four bodies in all, but it was impossible to determine the matter definitely. The following articles were found in this mound: two broken pots, a stone pipe, a stone knife, and an arrow-head.

MOUND NO. 7, (Plate III, fig. 7.)

This was a small mound, out of the line of the others, being fifty feet W. of No. 6. It was like No. 6 in size, but different from it in having a layer of stones, and under that, a thin layer of shells. Three and a half feet beneath the latter were found some fragments of bones almost entirely crumbled to dust, and two pots, one broken but the other almost entire, (Plate VIII, fig. 2) with some arrow-heads.

MOUND NO. 8, (Plate III, fig. 8.)

This mound, somewhat larger and higher than the average of the others, was distant two hundred feet, S. W. of No. 6, (i. e. in the general line or range.) After four and a half feet of stone, earth and shells, had been removed, two skeletons, [supposed to be those of an adult female and of a child,] were discovered. They lay near together and from E. to W. On the right side of the large skeleton were two broken pots, eight pieces of galena, two small arrow heads, and a number of smaller and larger stones of various shapes and colors, which were laid in a jagged or star-like circle. Here also was found a piece of mica, six inches long by three and a half inches wide. Over and around all these articles was a loam of some decayed material. They had probably been surrounded and covered with some light protecting stuff, as was most plainly to be seen in the case of the pots.

MOUND NO. 9, [Plate III, fig. 9.]

This mound was distant one hundred feet N. by W. from No. 1.

This had been reduced both by cultivation and hauling away the dirt, (over two hundred wagon loads being taken), thus taking away probably three or four feet in depth.

Near the present surface, a few shells and also a few scattered stones were found. About three and a half feet down, two skeletons were found in a horizontal position, lying from E. to W., bones very much decomposed. The skull of the western skeleton was preserved and is No. 8 of our collection, one-half of the lower jaw was found three feet from the skull, the other half could not be found.

The other skull four feet to the E. was so broken and tender as to fall to pieces, the lower jaw, however, which was in place, is preserved and is sound, being much stained by copper axe No. 12, [No. 6 of photographed series]. [Plate V, fig. 12, and also wood cut.]

The cutstone pipe, No. 7, Pl. IV, was found between the bodies. The Obsidian arrow head, [Pl. X, fig. 2,] and the flakes of the same, and three small arrow heads of white flint or chert, [figs. 3 and 4, Pl. X, and fig. 2, Pl. IX,] were in close proximity to the second, or stained skull. A small tinted arrow head was found two feet nearer the surface. One earthen pot, entirely broken up was found near the second skull.

In this mound was also found the implement made from a part of the scapula of a large river turtle, probably used as a spoon or rather a spatula or skimmer.

In several of these mounds, broken pottery was found scattered between the surface and the deeper parts, where the bones were found, as if pots had been placed in the surfaces of the mounds, as well as within.

It was remarked by the explorers that in some cases of horizontal burial, the faces of the bodies were turned downwards.

As the Rev. Mr. Gass was this summer [1875] passing by mound No. 3, he noticed that the earth at the edges of the excavation of 1874 had been much washed by the recent rains, and saw protruding, the curious copper implement, shaped like a spoon, which will be described further along. (Plate VI, fig. 22.)

DESCRIPTION OF THE AXES, (Plate V.)

Though so called none of them approach the common axe in shape, a more appropriate name would be chisels or wedges, they vary much in size; ranging in length from three and a half to seven and a half inches, and in thickness from a quarter to fifteen-sixteenths of an inch, and also in weight ranging from 0.42 pound av. to 2.49 pound. Some have the true wedge shape, with flat sides, while others are plano-convex, that is with one flat, and one rounded side. They are all smallest at one end, while at the opposite or cutting end, they have their greatest diameter, which is always also rounded.

These axes are all made from native copper by hammering, and in some of them the original lamellæ are shown by the scales which have escaped the action of the hammer. None of them show any evidence of ever having been cast or fused; though castings are said to exist in some collections, yet when we consider the high fusing point of copper, near 2,000° F., this fact would seem to have placed the casting of

copper out of the somewhat rude arts of the mound-builders. One of the copper beads was dissolved in nitric acid, and this tested for silver, but with a negative result. Native silver does exist in many specimens of Lake Superior copper, but it is not as an alloy, but as distinct crystals, and very sparsely disseminated through the mass.

As you are aware, authorities on Archaeology, arrange the succession of ages of pre-historic man in Europe, as stone, then bronze, and then iron, the copper age being absent.

Morlot says: "But the question arises, whether, previous to the discovery of bronze, man, owing to the great scarcity of tin, may not have begun by using copper in a pure state. If so, there would have been a copper-age, between the stone-age and the iron-age." Again he remarks: "In Europe the remains of a copper-age are wanting. Here and there a solitary hatchet of pure copper has been found. But this can be accounted for by the greater frequency of copper, while tin had usually to be brought from a greater distance, so that its supply was more precarious."

"As Europe did not witness the regular developement of a copper-age, it seems, according to Mr. Troyon's very just remark, that the art of manufacturing bronze was brought from some other part of the world, where it had been previously invented."*

Indeed, it is generally taught, that our Aryan ancestors brought bronze with them from India; this they may have done, but nevertheless, quite recent discoveries show that there was a copper-age in Europe, and that at an earlier period than the migration of the Aryans. As the copper-age must have preceeded the bronze-age in the other hemisphere, or the old world, as it is commonly termed, it may be admissible here to fix the age of the oldest bronze implement ever found, that is, whose age can be definitely solved. A few years ago, in 1870, I think, a bronze hook was found walled up in a secret crypt or chamber of the Pyramid of Cheops; now the age of this pyramid has been determined by two writers, each by a separate and distinct mode. According to Bunsen, Cheops, the builder of this pyramid, reigned in the 34th century B. C. According to Mohamed Bey, an Egyptian astronomer, 3300 years B. C., the rays of Sirius fell perpendicularly, at culmination, on the southern face of the pyramid, which is inclined 52.5° to the horizon. Now the copper implements, I shall soon mention, must be of a period previous to 3300 B. C., and though found in the Grecian Archipelago, and in Asia Minor, were in countries too near to, and too closely connected with Egypt, to be either subsequent in date, or contemporaneous with the above.

Of course, I allude to the magnificent discovery of vast quantities of copper arms and implements in and under the site of Ancient Troy.

Now, though some learned scholars doubt this being a discovery of the ancient city of the Iliad, yet no one doubts the facts of the ex-

*A late writer, quoted in *The Popular Science Monthly* for April 1875 gives Asia Minor as the birth place of bronze.

cavations themselves, nor the existence of the copper implements, which, with those of other metals, amount to hundreds in number, have been seen and described by hundreds of persons, and in themselves constitute a very fine museum, described and depicted in a magnificent folio work, recently published by the indefatigable Doctor. But even before Dr. Schlieman found copper implements at and under the site of Troy, they had been found in Europe. Between the years 1868 and 1871, on the islands of Theresia and Thera (modern Santorin) four houses were unearthed by Professor Fouquet and others, of the French Institute. These houses had stone walls, cemented with earth, and were covered by strata of volcanic ashes and pumice stone, 68 feet thick. In these houses many implements of pure copper were found. Now according to geologists, the central volcano, the only one whose ashes and pumice stones could have covered these houses, has been extinct since 2000 years B. C. I make the following extract from an article in the *Augsburg Gazette*, by Dr. Schlieman, being a reply to Professor Conze, who, in a lecture before the Austrian Museum, had cast doubts upon the idea that the ruins of Dr. Schlieman could be those of the Troy of Homer. Dr. S. says:

"In the second place, the age of the four houses discovered in Theresia and Thera is proved by the implements of pure copper found there.

"Except at Troy, where I found arms, implements, and vessels of the purest copper, immediately under the Greek Iliion, no such instruments have been found by explorers, even in the oldest settlements of Italy or Greece."

"As regards the royal treasures of Troy, which in Professor Conze's opinion, are of very recent origin, (belonging to Roman times therefore) there is positive proof that they may date back to the remotest times;—for the many battle-axes, lances and daggers found with the treasure; the key of the chest; the great embossed shields; the large and small stew-pans; and the long, thick plate (with its two immovable wheels) which seem to have been used as hinges, and which was certainly fastened to the chest, and to which a silver vase clings, molten by fire; all of these objects are of the purest copper, which has been found heretofore only in Siberia, and which is least of all to be sought for in Greek and Roman ruins."

But let us return to our copper implements.

Where did the mound-builders get their copper? It undoubtedly came from the region of Lake Superior, for though detached masses of native copper have been found in various parts of the United States, yet the vestiges of ancient mining are so evident at Lake Superior, and the quantity there known to have been mined by such rude processes as fracture with stone-hammers, and disintegration by the action of fire and water is too great to permit us to seek for any other source.

The ancient mines were on the Ontonagon river, near the present

Minnesota mine, at several places in Keeweenaw Point, and also on the fingers, as they are called, of Isle Royale. Considering the huge masses of copper got out by the ancient miners in the Superior region, some of which were detached, but almost in sight, it is surprising how few copper implements have been found in the mounds, or were known to have been in the hands of the Indians, at any time since the discovery of the country. This subject will however, be more fully treated of presently.

The earliest accounts of copper in the Lake Superior region are found in the journal of the Jesuit missionaries. The following quotations from the journals of the Reverend Father Claude Allonez, are taken from Foster & Whitney's report on the mineral region of Lake Superior. The Rev. Father says: "It happens frequently that pieces of copper are found, weighing from ten to twenty pounds. I have seen such pieces in the hands of the savages, and since they are very superstitious they esteem them as divinities, or as presents given to them to promote their happiness by their gods, who dwell beneath the water. For this reason they preserve these pieces of copper wrapped up in their most precious articles. In some families they have been kept for more than fifty years, in others, they have descended from time out of mind,—being cherished as domestic gods."

Again the Rev. Father, at the Grand Council at Sault St. Marie, in May, 1671, when speaking of Louis XIV, and his greatness, said to the Indians there assembled: "What shall I say of his riches? You think yourselves rich when you have ten or twelve sacks of corn, and hatchets, and kettles, and other things of the kind.

"In each city are shops containing hatchets enough to cut all your wood, kettles enough to cook all your caribou, and sugar enough to fill all your wigwams."

Of course the probability is that the hatchets mentioned were neither of copper nor of stone, but it shows that hatchets were estimated highly in the order of riches. Now I think the so-called copper axes from the mounds were not axes, in the proper sense of that term, that is to say, that they were never used as such, but were kept as treasures, or possibly as insignia of rank. The form of the oblong chisel or wedge, with a flaring rounded edge being taken from that of some implement in actual or former use. Just as with us, the badges of the highest rank, the royal sceptre and the baton of the field-marshal are nothing more or less than ornamented truncheons, or cudgels, made of ivory or the precious metals. Again the implement in the hands of the chief officers of deliberative bodies, such as our Congress or the British Parliament is nothing but a hammer; while for the same purposes of order the French use a ball. In support of the above proposition, I would mention the following facts:

In our collection of twenty axes, there are several obviously too light for use as tools, indeed none are heavy enough to be efficient as

such; none show any signs of usage, as indented edges, etc.; not one bears the mark across its surface of having been imbedded in a wooden helve, as in the case of a copper axe described and figured by Col. Jones in his work on the Antiquities of the Southern Indians. Again, though copper is somewhat hardened by hammering, the edges of these axes are not notably harder than other parts, and the known lamellar nature of the Lake Superior copper would prevent any great degree of hardening. I may here also mention that among these axes none show any signs of having been cast, as is the case with some implements in the Perkins collection mentioned by Foster.

In regard to the abundance or scarcity of copper implements at any former time in America, Mr. Charles Rau, a recent and able writer on the subject, holds the opinion, that they were never of sufficient abundance as implements, or such widely extended use as to have modified in any manner the civilization of the continent, or in other words, that there never was a true copper-age in America. And this opinion, I think is correct, at least according to the extent of my reading on the subject, though not in accordance with my former impressions, or the commonly accepted views of others.

I shall conclude my remarks on copper, by quoting from various authorities, to show the quantity of copper implements (axes especially) now in various museums; and also the use or possession of them by the Indians since the appearance of white men among them.

Rau states [Smithsonian Report 1872] that "the age of stone, and that of iron, meet almost without an intervening link, for the so-called North American "copper-period" was of little practical significance."

He also states somewhere, but I have mislaid the reference and quote from memory, that during his ten years' residence at St. Louis, though engaged all the while earnestly in archaeological research, he was unable to procure a single copper axe. In 1870 the Smithsonian Institution had only seven copper objects, one of which was an axe.

There are two very large private collections of objects from mounds, in the city of Maysville, Ky., whose neighborhood is very rich in relics, here among over 4000 objects, not a single copper-axe is mentioned.

In the Peabody Museum of American Archaeology there must be few, if any, copper axes, as no mention is made of any in the reports in our library, up to 1873. One copper axe is described, as above stated, by Col. Jones, in his large collection from Georgia and Florida.

Dr. Jones of New Orleans, though sometimes finding small copper ornaments in his extensive explorations of the mounds and stone graves of Tennessee, makes little or no mention of copper axes.

Foster describes and figures but three copper axes, one from the Chicago Academy of Sciences' collection, [since destroyed] and two from the German Natural History Society's Museum of Milwaukee.

The largest collection of copper implements in this country seems to be that of Mr. F. S. Perkins, of Burlington, Wisconsin; this contains 60 specimens, of which 6 are axes, or chisels, as they are called by Foster, in his description of them.

Our collection embraces, at present, 20 copper axes; eleven awls or borers, 2 ear-pendants; and a large number—over 200—copper beads.

COPPER AMONG THE INDIANS.

Sir Walter Raleigh observed copper ornaments in the hands of the Indians of the Atlantic coast, though according to Col. Jones none have ever been found in the numerous mounds opened on the coasts of Carolina, Georgia and Florida.

The historian of the expedition of Fernando de Soto makes specific mention of copper implements but once, and that was of some chopping knives at Cutipachiqui, which were thought to have a mixture of gold in them. Cabeza de Vaca, who, you will remember, traversed the whole continent, from the Atlantic coast of Florida, to the Pacific coast of Mexico, mentions only two copper articles as seen by him, one a bell-shaped object, in Florida and another, shaped like a bird's head, in Texas.

Another writer, Garcilasso de la Vega, mentions among articles seen in Florida, copper hatchets, bands of copper, and copper spindle, with which, when heated, the natives bored holes in pearls.

Coming down more than a century—that is, toward the end of the 17th century, we find Hennepin, when descending the Mississippi, entertained by a chief, on the right bank of the river, [probably of the Tensas, a branch of the Natchez] who was preceded by two attendants bearing a large plate of burnished copper. I shall conclude the subject of copper now, by merely mentioning the fact, that the Indians of our extreme north-western province, Alaska, were in possession of copper ornaments, when first discovered by white men, toward the close of the last century.

La Perouse, the great French explorer, speaking of the Thinkleets, says: "They excel in the working of stone and copper, making necklaces, bracelets and rings (probably of the latter) and they can also forge iron."

Capt. Cook speaks of having seen in the hands of a neighboring tribe, the Nootkas, "a painted and ornamented plate of native copper, $1\frac{1}{2}$ feet by $2\frac{1}{2}$ feet, kept with great care in a wooden case, also elaborately ornamented. It was the property of the tribe at Fort Rupert, and was highly prized, and only brought out on great occasions, though its use was not discovered.

*The early Russian explorers mention the same facts as to copper, which is in frequent use as ornaments at present, especially in the curious labret, which is worn in the lips of the women, and is often of great size. This copper comes, in all probability, from some part of

*Bancroft's Wild Tribes of the Pacific Coast, vol. I, *passim*.

the Copper-mine River, which runs from the Great Slave Lake, in latitude 62° to the Arctic Ocean, and finds its way some distance down the coast of the Pacific, through the hands of the coast tribes of the Hyperborean Indians, some of whom are great traders; indeed whole tribes (as the Tacullees or Carriers,) are engaged in transporting and exchanging the products of other tribes; this commerce embracing in its extent many hundred miles of our coast, and even extending to the opposite continent of Asia.

WEAVING AND SPINNING.

We have conclusive evidence that the so-called Mound-builders possessed the art of spinning and weaving cloth, in the specimens of it adhering to no less than six of the copper-axes in our Museum.

In the first part of this paper, a brief detail was given of this important discovery, and in it the Rev. Mr. Gass is quoted as saying that in the third mound were found "five copper-axes, three of which were wrapped up in cloth," now in fact, all five must have been so wrapped, not together, in a bundle, but each axe separately, as all five have pieces of cloth adherent, and that on both sides.†

To show the almost unique character, and great archæological value of these specimens of cloth, the following observations may be allowed.

The first discovery of cloth in the mounds is described in the ancient monuments of Squier & Davis. The specimen was taken from an altar or sacrificial mound in Butler county, Ohio. It is described as "cloth, perfectly carbonized, as though ignited and then smothered." This specimen, if in existence, is in the Blakemore Museum, at Salisbury, England.‡

Foster says that in 1838, he got from a person in Jackson county, Ohio, a specimen of cloth taken from a mound; this he did not preserve, nor did he publish an account of it, thinking as he says: "That, this fact was in itself so novel, and so at variance with the prevailing ideas as to the degree of civilization and knowledge of the arts among the mound-builders, that I hesitated about making it public, fearing that the cloth might be a modern substitution, and that by publishing this fact, I might be the means of propagating an error."

Foster again, in 1851, got from Butler county, Ohio, specimens of charred cloth, which he figures and describes as showing two kinds of weaving; one of the ordinary kind, or the alternate intersection of the warp and woof; and the other, where the woof takes a turn around

†Since the above was read, more cloth-covered axes have been recovered from mounds, which are described on another page.

‡Since this was written, I have found direct evidence of the whereabouts of this fragment in the following statement. At the meeting of the International Congress of Pre-Historic Archaeology held at Norwich, England, in 1888, one of the speakers said: "Fragments of charred cloth made of spun fibres have been found in the mounds. A specimen of such cloth taken from a mound in Butler county, Ohio, is in Blackmore Museum, Salisbury. In the same collection are several lumps of burnt clay, which formed part of the altar, so-called, in a mound in Ross county, Ohio, to this clay a few charred threads are still attached."

the warp, which could not be done except by the hand,—this probably was not woven at all.

Lapham in the *Antiquities of Wisconsin*, describes the finding of cloth as follows: "Several feet below the surface of the large square mound was found, what appeared to be the remains of cloth, apparently enveloping a portion of a human skeleton." Its texture was open, like the coarsest linen fabric, but the threads were so entirely rotten, as to make it quite uncertain of what material it was made.

In the removal of the great mound at St. Louis, in 1864, patches of cloth more or less carbonized were found, with two copper vessels, like spoon-bowls.

These are all the specimens of cloth mentioned in any works on American Archæology I have seen, and you can perceive how imperfect they all were, and estimate the improbability of their preservation. Our specimens are preserved by the antiseptic action of the carbonate of copper, by which they are dyed of a bright green color, and rendered incorruptible.

In the fifth annual report, (1872) of the Peabody Museum of American Archæology, Dr. Wyman, the Curator, says: "It is an interesting fact that while every trace of the cords and woven textures made by the Mound-builders has perished, we have impressions or casts of the first left with sufficient distinctness on the earthen vessels to determine the style of twisting and the number of strands; and of the second to ascertain, in some cases at least, the manner in which the cords are interwoven." "The texture with closed meshes is handsomely woven, and in one instance, of threads not exceeding the one-thirtieth of an inch in diameter."

Again in speaking of the Clement collection of objects taken from the lake-dwellings at Robenhause, which contained, among other things, woven fabrics, Dr. Wyman makes the following remark, which I quote in this connection as sufficiently curious. He says:

"Among these last—that is the woven fabrics—we have the ordinary fabrics, composed of a single warp and woof, and one of identical texture with that of which we have casts on the surface of some of the earthen vessels from the mounds of Tennessee," and I might add, of identical texture with that of the cloth adhering to our copper-axes, thus strangely connecting two pre-historic peoples, the Mound-builders, and the Lake-dwellers of Switzerland.

Upon a careful examination of the cloth upon copper axe No. 12, it is evident that the warp is composed of four cords, that is, of *two doubled and twisted* cords; and the woof of *one* such doubled and twisted cord which passes between the two parts of the warp; the latter being *twisted* at each change, allowing the cords to be brought close together so as to cover the woof almost entirely, (See Pl. V.A.)

It is interesting to observe, that among the relics discovered in the explorations of the ancient Swiss lake dwellings, are carbonized speci-

mens of various fabrics of flax, and among them some of precisely the same structure as this.

It is described by Dr. Ferdinand Keller, in his 4th Report on Swiss Lake Dwellers' Remains, 1861, and figured on Plate 4, fig. 10 of that work.

The most interesting account of mound-builders' cloth, is one in an article on the Mound Builders of Tennessee, in the 8d volume of the American Naturalist, by Dr. Joseph Jones, of New Orleans; it is there quoted from Heywood's Natural and Aboriginal History of Tennessee:

"During the spring of 1811, embedded in the flooring of a copperas cave, in Warren county, East Tennessee, two human bodies, male and female, were found. They were evidently *Indians* (?) and had been interred in curiously wrought baskets, made of cane, with coverings of the same material fitting over their tops. The flesh of these persons was entire and undecayed, of a brown, dryish color produced by time, the flesh having adhered closely to the bones and sinews. Around the female, next her body, was placed a well-dressed deer-skin; next to her was placed a rug, very curiously wrought, of the bark of a tree, and feathers. The bark seemed to have been formed into small strands well twisted; around these strands feathers were rolled, and the whole woven into a cloth of firm texture after the manner of our common coarse fabrics. This rug was about three feet wide, and between six and seven feet long. The whole of the ligaments thus formed of bark were completely covered by the feathers, forming a body of about one-eighth of an inch in thickness, the feathers extending about one-fourth of an inch in length from the shroud to which they were confined. . . . The next covering was an undressed deer-skin, around which was rolled, in good order, a plain shroud, manufactured after the same order as the one ornamented with feathers. This article resembled very much in texture the rugs used for the purpose of holding the coffee exported from Havana to the United States. . . . The hair, which still remained on their heads, was entire. That of the female was of a yellowish cast, and of a very fine texture. The cave in which they were found abounded in nitre, copperas, alum, and salt. The whole of the covering with the baskets, was perfectly sound, without any marks of decay."

I have taken the pains to compare our mound-builders' cloth with that of the inner and finer sack, which now comes with coffee and have found the two structures to be very much alike.

It would be an egregious error to infer from the importance attached to the subject of mound-builders' cloth, that the art of spinning and weaving was not possessed by the modern Indians, at the time of their first contact with the whites, or at any subsequent time, even up to the present. Into this error, however, Foster has fallen, as the following quotation shows. He says:

(Pre-historic Races, p. 226.) "I see no reason, then, why cloth manufacture should not be included among the arts of the mound builders.

There is no evidence that the Indians possessed this art when first known to the white man—an art which, when once acquired, would not be permitted to lapse." On the other hand, hear what Adair says in his *History of the American Indians*: "London, 1775. Formerly the Indians (meaning hereby the Cherokees, among whom he lived for some time) made very handsome carpets. They make them of wild hemp." He then proceeds to tell how they pull, steep, peel and beat it, and how the old women spin it off the distaffs, with wooden machines, having some clay in the middle of them, to hasten the motion. When the coarse thread is prepared, they put it into a frame, about six feet square, and instead of a shuttle, they thrust through the thread with a long cane, having a long string through the web, which they shift at every second course of the thread.

Adair was informed, that the Muscogees, time out of mind, passed the woof with a shuttle, having a couple of threddles which they move with the hand, so as to make good dispatch, something after the manner of our weaving. The women were the manufacturers of these fabrics. Buffalo's wool was extensively used for spinning and weaving. The Choctaws made "Turkey-feather blankets, with the long feathers of the neck and breast of that large fowl." The inner end of the feather was twisted and made fast in a strong double thread of hemp, or coarse twine, made of the inner bark of the mulberry tree.

In conclusion, I will make some remarks concerning the condition of the arts of spinning and weaving among what Bancroft, in a work recently added to our library, calls the Wild Indians of the Pacific coast; from which elaborate work most of the following information is derived. Commencing with the Thinkleets, who are of the Hyperborean Indians, next south of the Eskimos, and inhabit a portion of Alaska, it is said of them: "They spin thread, use the needle, and make blankets of the native white wool." Again quoting from Lisiansky's *Voyage* (1803): "In one place was found a considerable store of woollen cloth."

Then of the Chinooks, who live in Oregon, about latitude 44° N., Catlin, in his *American Indians*, Vol. 2, page 113,—speaking of these Indians and their neighbors, on the N. W. coast, says: "... As well as specimens of their spinning and weaving, by which they convert dogs' hair and the wool of the mountain sheep into durable and splendid robes, the production of which, I would venture to say, would bid defiance to any of the looms in the American and British factories." Of the Nootkas, who live about Van Couver's Island, in latitude 50° N., it is said by Capt. Cook, "that they make woollen cloths of all degrees of fineness," and by another explorer, that "the instrument used for weaving, differed in no apparent respect from the rude loom of the days of the Pharaohs." Making a great leap southward, over the California Indians of the coast and the Snakes of the interior, we come to the Navajos and the Apaches.

These Indians are allied in language to the Tinnah, or Chipeway

ans of the great Athabasca family, which is stretched across the continent, just South of the Eskimos, but inhabiting the interior, and not reaching either the Arctic or the Pacific oceans; these Indians neither spin nor weave, but clothe themselves in the skins of animals.

The Navajos, however, excel in the manufacture of blankets. The art with them is probably of Mexican origin, and they keep for their industry large flocks of sheep. Some say, in making their blankets, cotton is mixed with the wool; but I find no mention of their cultivating cotton.

Their looms are of the most primitive kind. Two beams, one suspended, and the other fastened to the ground, serve to stretch the warp perpendicularly, and the slats inserted between the double warp, cross and re-cross it, and also open a passage for the shuttle, which is simply a short stick with some thread wound around it. The operator sits on the ground, and the blanket, as the weaving progresses, is wound round the lower beam.

The Pueblos are said, in the manufacture of blankets, of cotton and woolen cloth, and of stockings, to excel their neighbors, the Navajos, employing, essentially, the same method, and using looms and spinning instruments similar to those before described.

The northern Mexican Indians—the Ahomos, the Endetes, and the Yakis, weave fabrics out of cotton or agave-fibre, such as blankets or serapes, and cloth with colored thread in neat designs and figures. Their looms consist of short sticks driven into the ground, to which a frame is attached to hold the thread. The shuttle is an oblong piece of wood, on which the cross-thread is wound; after passing through the web, the shuttle is seized and pressed close by a ruler three inches in breadth, which is placed between the web and supplies the place of a comb.

In the state of Jalisco, in 20° N. latitude, the natives are celebrated for the manufacture of blankets and woolen mantas; in other parts of the country (that is, in Central Mexico) they continue to manufacture cotton stuffs in the same manner as before the conquest, all in very primitive hand-looms.

When Fernandez de Cordova explored the northern coast of Yucatan, he found the people clad in cotton garments, and at the present day this forms the principal material from which their clothing is made.

According to Squier, the Nicaraguans are not behind hand in the art of weaving, for most of the fabrics used in the country are of native make. The aboriginal spindle is yet used and a loom like the Mexican.

And lastly, among the Isthmian Indians, or those of Panama, cotton clothes are worn by women, and considering the rude and simple implements they work with, the fineness of texture and blending of colors, present a marvel of skill and patience.

It would thus appear, that not only did the Indians of the southern

part of the United States possess the art of spinning and weaving at the time of their first contact with the whites, but we have also traced the use of the spindle and the loom, almost continuously among the wild Indians from Alaska to the Isthmus of Panama.

At the meeting of the American Association held at Detroit, August 1875, Dr. Farquharson, at the request of this Academy, read a paper on the recent mound discoveries in this vicinity. As it contained some additional observations, it has been thought advisable to insert a portion of it as a supplement to the foregoing paper.

SILVER.

The only ornament of silver found was a hollow hemisphere of 0.7 inch diameter, weighing $13\frac{1}{2}$ grains, found in Mound No. 2 (Plate VI, fig. 19), in company with two hemispheres of copper, of the larger of which it is an exact counterpart. On the surface of the spoon-shaped implement from mound No. 3 appears a surface with a coating or wash of silver, this will be considered in the description of that curious specimen.

COPPER.

The Davenport collection of copper implements, at present consists of twenty copper axes, of which eight are more or less covered with cloth; eleven copper awls or borers; two ear pendants; a great many copper beads and the spoon-shaped implement.

The axes are of three shapes, with flat sides, plano-convex, and double-convex, are all wrought by hammering, many retaining the original laminae or scales on the surface; there are no signs of use, and they are not notably harder at the edge than elsewhere.

The following table shows their source, weight, shape, size, etc.

Table of Copper Axes.

Plate V, figures correspond to the numbers in the table.

No.	No. of mound.	Weight Pounds avoird.	Shape.	Length inches.	Width at end inches.	Width up edge inches.	Greatest thickness inches.
1	Mound No. 3	1.0721	Flatsides..	6 $\frac{1}{2}$	2 $\frac{1}{2}$	1	$\frac{1}{2}$
2	" " 3	1.1564	..Flatsides..	7 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{3}{4}$
3	" " 3	0.5387	Plano-convex	4 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
4	" " 3	0.1056	Plano-convex	5 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
5	" " 3	0.9961	Plano-convex	5 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
6	" " 1	0.4242	Plano-convex	3 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
7	" " 4	0.8114	..Flatsides..	5 $\frac{1}{2}$	3	1 $\frac{1}{2}$	$\frac{1}{2}$
8	" " 1	0.4602	Plano-convex	3 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
9	" " 2	0.8464	..Flatsides..	6 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
10	" " 2	0.5085	Plano-convex	3 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
11	" " 5	1.6375	Plano-convex	6	3 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
12	" " 9	0.8743	..Flatsides..	5	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
13	" "	0.4987	Plano-conv x	4	2	1	4-10
14	" "	0.8171	..Flatsides..	5 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	7-16
15	" "	1.7700	..Flatsides..	5 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$
16	" "	1.6314	Plano-convex	6 $\frac{1}{2}$	3	1 $\frac{1}{2}$	$\frac{1}{2}$
17	" "	0.5143	Plano-convex	4	2 $\frac{1}{2}$	1 $\frac{1}{2}$	7-16
18	" "	0.2143	Plano-convex	3 $\frac{1}{2}$	1 $\frac{1}{2}$	1	$\frac{1}{2}$
19	" "	2.4935	Bl-convex...	5 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$	15-16
20	" "	0.9257	..Flatsides..	4 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{1}{2}$

*Mound near Princeton, Scott County, Iowa.

†Mound near Toolesboro, Louisa County, Iowa.

Of these axes, Nos. 1, 2, 3, 4, 5, 12, 14, 16, 19, and 20, are more or less covered with cloth; besides these, Nos. 6 and 8, found together in mound No. 1, were also covered with cloth, which was unfortunately scraped off, when being cleaned of dirt with a knife, this fact is shown by the small patches of cloth, bits adherent which have escaped the knife.

The eleven copper awls, (ten of which come from mounds), being of the ordinary kind need no description, except that the bent extremities of some, suggest their possible use as hair-pins (Plate VI, figs. 5, 7, 8, 9, 10, 11.)

The copper ear pendants are thin hemispheres, 0.8 inch diameter and 84 grs. weight, (Plate VI, fig. 21) and 0.5 inch diameter and 10 grains weight, (Plate VI, fig. 20.)

The spoon-shaped copper implement (Plate VI, fig. 22) which comes from mound 3, (but in what relation to the other things recovered from that mound is not known), has evidently been produced by hammering, but from certain marks on the surface, not from an original piece of copper, but from a bar already bearing these marks, which are obliterated in most places by the action of the hammer.

Its dimensions and weight are as follows: the whole length, 82 millimetres; length of the spoon part, 22 mm.; breadth of handle, 8 mm.; breadth of spoon at widest part, 14 mm.; average thickness of handle, 2 mm.; thickness of point of spoon part, 1 mm.; thickness of the middle part of spoon, $\frac{1}{2}$ mm.

The implement appears to be of pure copper and weighs 86 grains.

On one side of the handle, nothing but the marks of the round-faced hammer or stone is found, but on the other, a series of indented lines, in rows up each margin of the handle for the distance of an inch, and again in the arc of a circle, just at the junction of the handle and broad part is plainly visible with a lens. This ornamentation is like the milling at the edge of a coin, and was evidently made here, before the action of the hammer; on the same side is seen the spot of silver.

The copper beads may be divided into three classes, small tubes of an average length of one inch, and an average weight of 16 grains, [Plate VI, fig. 13, 14, 15]; of an average length of 1.5 inches, and an average weight of 1.15 grains, [Plate VI, fig. 12]; and lastly of very short tubes, almost round, of 0.3 inches average length and $12\frac{1}{2}$ grains average weight. [Plate VI, fig. 16, 17, 18, 17a, 18a].

All these beads or tubes are made of thin strips of copper rolled up, after being beaten out by hammering.

CLOTH.

These interesting and undoubted specimens of mound-builders' cloth, have been preserved by the the antiseptic action of the salts of copper, in all probability the carbonates. In all the specimens, one set of threads, say of the warp, is doubled and twisted, and there are about four to the quarter of an inch.

The texture of the cloth is best seen on both sides of No. 12, [Plate V, fig. 12]; here, however, in many places, the original vegetable fibres have entirely disappeared, their forms being exactly retained and their places taken by fibrous crystals of carbonate of copper. This fact is apparent under the microscope and was further confirmed, when upon slightly heating a fragment on a glass slide, the whole form melted away, dissolved in water of crystallization.

In No. 2 [Plate V, fig. 2], the woof is evident, and consists of a rough thread not so tightly twisted as that of the warp.

This appears to be a different style of weaving, there being only two and a half threads of the warp to a quarter of an inch; but it may be that it is only the wrong side of the cloth.

The fibre under the microscope appears to be a kind of hemp, possibly the *Apocynum Cannabinum*, or Indian hemp,* formerly used by the Aztecs. [Am. Naturalist, Dec. 1873.]

The thread is spun evenly, and of a pretty uniform diameter of one m m. or the 1-26 of an inch in diameter, which measurement very nearly agrees with that made by the late Dr. Wyman from marks or indentations on mound pottery. [Plate VIII, fig. 4].

MICA.

Besides the large piece of $6\frac{1}{2}$ by 4 inches, numerous small bits were found.

PIPES. [Plate IV.]

The pipes, fourteen in number, were not all from the mounds below Davenport, one came from a mound on Rock River, Rock Island county, Illinois, and several from mounds near Toolesboro, Louisa county, Iowa.

They are all of the so-called mound pipe pattern, and some of them carved into effigies of birds† and animals, [Plate IV, figs. 4, 5, 10, 11, 13, and 14].

The material of which they are made, varies from a very hard, greenstone, through varieties of Catlinite, or an approach to it, to others of marly nature, effervescing with acid, quite soft and much corroded by the action of the soil water.

GALENA AND RED OCHRE.

The masses of galena and red ochre need no description nor comment, except, perhaps, the great quantity of the latter found in mound No. 3.

*I have lately received from the hands of Col. D. A. Robertson, some of the fibres of the *Urtica Gracilis*, which he suggests may have been the kind of fibre used; upon comparison, under the microscope, the suggestion appears probable, though from the known difficulty of distinguishing the various woody-fibres from each other, the problem appears insoluble.

†One bird has eyes of copper, another has eyes of pearl. These pearls had been made and perforated for beads before being introduced into the head of the bird, the holes, however, were not visible until the pearls were removed and cleaned. As evidence of great skill and delicacy of manipulation, these holes drilled through such delicate and fragile structure as pearl are worthy of remark. The combined weight of the two pearls is 2.68 grains. Their form is nearly spherical, with a diameter of four mm. The drilled holes are conical, the greater and less diameters being respectively, $1\frac{1}{2}$, and 1 millimetres.

SHELLS.

Besides the ordinary river shells constituting the layers in the mounds, large sea shells were found, in some instances only the axes and parts of the inner whorls remain, but again in others, the shell was found nearly as it was fashioned by the mound builder from the original. The shell from mound No. 1 is a *Pyrula*, which has been cut through in its length about an inch above the centre of the base, and the axis and whorls removed, there is a hole, of an inch diameter in the centre of the base, the result of accident.

This shell at the line of section has a long diameter of thirteen, and a transverse of seven inches. Its internal capacity is 104 cubic inches, nearly four pints. Another fine specimen of a sea-shell has recently come into the Museum of our Academy, from a mound near Piacetree Creek, Muscatine County, Iowa, some twenty miles from Davenport.

This is a *Dolium*, and except being broken across its length, is a fine specimen, it is much thinner and lighter than the *Pyrula*, but whether from greater age, or an original greater thinness was not made out. In the line of section it has an extreme length of nine inches, and a breadth of six inches. Internal capacity—152 cubic inches, or five and a half pints. The greatest length of the shell being nine and a half, with a width of six inches, the section being made near one side, so as to give a much greater depth than in the *Pyrula*.

ARROW HEADS AND FLAKES.

The arrow heads found with the bones, copper-axes, etc., at the bottom of the mounds were eleven in number, (Plate X, figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11). They were of the usual form and size, with the exception of one found in mound No. 9, which was very small, only one inch by half an inch; this is finely wrought and seems now as if just out of the hands of the maker, it is of a pure white flint or chert.

Most of the others differ in form or material from hundreds of others found on the surface.

An exception must however be made in favor of the arrow-head, and flakes of a dark, almost black material looking like glass, and at first supposed to be obsidian, from its marked resemblance to arrow-heads in our Museum, marked obsidian and brought from Utah. But upon applying the blow-pipe flame to a fragment, it proved refractory, and it was thought to be smoky quartz.†

BONES AND TEETH OF ANIMALS. (Plate VII.)

In mound No. 2, was found what was called a string of snake bones, being the vertebrae of a small snake, which may have been introduced accidentally, as there is no evidence of their ever having been strung on a thread like beads.

The lower jaws with detached incisors of the muskrat, and other small gnawers, probably gophers and ground-squirrels were quite abundant, as also tips of deer-horns.

†Since the above was read, we have succeeded in fusing the edges of all these specimens, under the blow-pipe.

In one mound were found the enamel from the incisor of the beaver; the rest of the teeth all gone.

Adherent to the inner surfaces of the fragments of some of the large pots or vases were bones of the river turtle, from whose shoulder blade the curious spatula from mound No. 9 was made. Many teeth of the common black bear were found; both molars and incisors; of the latter, some of large size, were polished and perforated, doubtless for wearing as ornaments: (Plate VII, fig. 2).

In this connection, though found in one of the Albany Mounds in Illinois, may be mentioned the curious specimen of what appears to be the canine of a large bear, (the grizzly); from its perforation and highly polished surface, it has evidently been worn as an ornament. (Plate VII, fig. 1). It appears to be the half of a tooth; the section being made longitudinally through the middle; the outside presents exactly the appearance of a natural tooth with the enamel removed or worn off; but regarded upon the other side, the great width of the cavity and its running up to the extreme point of the tooth, gives the idea of a false tooth made from a long bone.

This was in the Smithsonian Institution and was returned to us with the question unsettled, since which our President, Dr. E. H. Hazen has submitted a section to the microscope, and with the result of determining it to be a portion of a long bone and not a tooth.

POTTERY.

Besides fragments, in nearly every one of the mounds, at least two pots were found at the bottom, in company with the bones and other relics.

Only one pot was recovered entire, and this came from mound No 7, which contained besides, only fragments of another pot, an arrow-head and some human bones.

This pot [Plate VIII, fig. 2], is of a reddish color, not glazed, and of rude workmanship, evidently made by the hand, as the bottom is not level, and the top rim is not truly circular. Its dimensions are as follows: height, $5\frac{1}{2}$ inches, diameter of bottom, $2\frac{3}{4}$ inches; upper margin elliptical with a major axis of $5\frac{1}{2}$, and a minor of 5 inches; the ornamentation consisted of a crenated margin, then a row of knobs or projections, corresponding with holes on the inside, and both made by indentation from within, the neck of the vessel being marked by a girdle of vertical indentations, each an inch long and close together; capacity, 70 cubic inches, or $2\frac{1}{2}$ pints. One of the two large vases, (Plate VIII, fig. 1) with turtle bones adherent, found in No. 3, in close connection with the five cloth-covered copper axes, has been nearly restored by the patient labor of our Curator, Mr. W. H. Pratt. Its description is as follows: Thickness, $\frac{1}{4}$ inch; height, 11 inches; diameter of rim, $7\frac{1}{2}$; depth of base, 4 inches; circumference of rim, $24\frac{1}{2}$, of base, 13, of neck, 23; capacity, 325 cubic inches, or 1 gallon and 3 pints.

Ornamentation, rude, from rim to neck small indentations, with a number of large knobs or protuberances, corresponding to depressions on the inside. On upper part of body, rings and rude figures made by a blunt point.

STYLE OF ORNAMENTATION OF OTHER FRAGMENTS.

A few fragments were found where the impressions were made by a string or thread [Plate VIII, fig. 4]; these when copied on gutta percha, were found to be of two kinds, single and doubled and twisted; these impressions of string, were on small triangular divisions, separated from each other by rows of holes, and it was not easy to discover how they could have been made.

From a mound in Buffalo Township, Scott County, Iowa, came the vessel figured in Plate VIII, fig. 3. But the most curious specimen of pottery in our collection, is a ring or pulley [Plate VIII, fig. 5] which nearly resembles the stone one figured and described by Mr. Rau, in his article on stone-drilling in Smithsonian Report, 1868, the original being in the Blackburn Museum. Flint Chips, p. 511.

DESCRIPTION, COLOR, FORM, SIZE, ETC.

Color almost black; fracture dark gray; spots white and effervesced with acids, probably pounded shells; well baked.

Greatest diameter, 1 11-16 inches; thickness at margin, $\frac{3}{4}$ inch; diameter of central aperture, $\frac{5}{8}$ inch; thickness at edge of aperture, $\frac{1}{8}$ inch; depth of the groove, $\frac{1}{8}$ inch; its width, $\frac{3}{4}$ inch. From the groove eight small holes pass to the central aperture; these are not exactly straight, no doubt, from having been warped in baking.

The stone specimen, figured by Rau, is over two inches in diameter, and the central aperture is larger; otherwise the two implements are very much alike, [Plate VIII, figs. 5 and 5a].

HUMAN BONES.

Near the surface of one of the mounds (No. 3.) were found some bones, quite recent, evidently an intrusive burial.

Two of these are preserved for their strange mutilation, one a femur, has been cut across near its lower end, by repeated blows of a sharp instrument, and the other, a tibia, from which a slice has been taken off by a glancing blow of the same.

Of the bones, at the bottoms of the mounds, very few were preserved, as they were so fragile as to crumble away upon being handled, in this respect presenting quite a marked contrast with the bones got by our academy from the mounds at Albany, two years ago. Besides a difference of age, the difference of the sites might account for this, the Albany mounds being on a high ridge, with good drainage, and composed of a light sandy loam, while the Davenport mounds are but little above high water mark, have no drainage and are in alluvial soil.

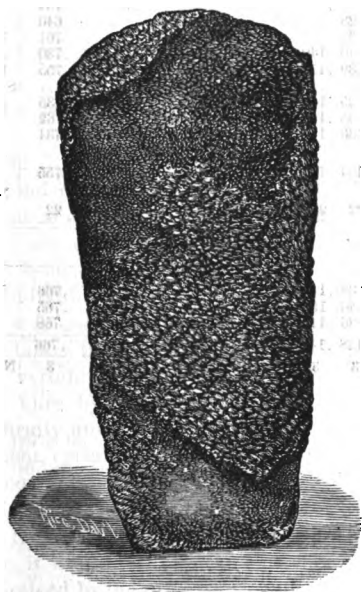
From mound No. 2, in connection with copper axes and beads, we have two fragments of skulls, each being the frontal bones, with

nasal bones attached; nothing of the shape of the skulls can be inferred from them, but both indicated a very highly arched nose.

From mound No. 9 was recovered a skull in connection with copper axe No. 12, which is in a pretty good state of preservation, and which gives the following measurement, given in a table to compare the corresponding measurements of a mean of three Sioux (who died in captivity here), and of nine from Albany mounds, of eleven from Rock River, and of four from Henry county, Illinois.—

Table II.

Race.	Horizontal circumference.	Long Diameter.	Transverse diam.	Inter capacity C. inches.	Distance of Foremen ang.	Ratio of distance.	Ratio of diameters.
Mean of 6 Sioux.....	30.50	7.08	5.1	77.64	2 inches.	0.384	0.735
Mean of 9 Albany mds.	19.8	6.8	5.1	68	2.3	0.335	0.708
Mean of R. R. mounds.	30.15	7	5.4	74.48	2.0	0.386	0.771
Mean of 4 Henry Co. mounds.....	19.5	7	5.2	74.47	2.14	.305	0.743
Skull from Davenport No. 9.....	19.5	7	5.25	76.20	1.8	0.269	0.758



Axe No. 12.

Table III.

Measurements of mound skulls, and of skulls of Sioux Indians. The foraminal distances are taken with Wyman's instrument, and are therefore more reliable, than those in the preceding TABLE. Numbers correspond to those of the figures in Plates XX, XXI, XXII, XXIII, XXIV, and XXV.

No.	Horizontal circumference.	Long diameter.	Thick-est diameter.	Vertical diameter.	Capacity in cubic centimetres.	Foraminal distance.	Foraminal Ratio.	Ratio of diameters.	Mounds.
1	.546	.206	.180	.140	1190	.....	.....	.600	Albany, Ill.
2	.483	.163	.128	.140	1190	.042	.882	.730	"
3	.496	.174	.130	.135	1220	.077	.442	.752	"
7	.508	.170	.140	.125	.....	.....	.....	.883	"
8	.446	.175	.135	.140	1249	.065	.870	.771	Davenport Md. No. 3.
9	.508	.171	.140	.140	1224	.062	.862	.818	Rock River, Ill.
10	.508	.167	.148	.140	1225	.070	.419	.886	"
11	.533	.180	.145	.145	1362	.....	.....	.883	"
12	.457	.167	.133	.140	1221	.....	.....	.766	"
13	.532	.185	.130	.150	1362	.069	.427	.702	"
14	.483	.171	.133	.140	1392	.079	.460	.807	Henry County, Ill.
15	.506	.185	.138	.145	1306	.461	.448	.745	"
16	.457	.170	.130	.140	1135	.078	.448	.764	"
17	.533	.185	.135	.140	1249	.072	.389	.730	"
18	.508	.180	.....	.140	.....	.....	.....	.....	Rock River, Ill.
19	.533	.196	.140	.140	.....	.....	.....	.704	"
20	.....	.200	.128	.....	.....	.....	.....	.640	"
21	.....	.180	.137	.....	.....	.....	.....	.761	Henry County, Ill.
23	.....	.170	.140	.140	.....	.073	.410	.730	Albany, Ill.
24	.....	.184	.139	.130	.....	.068	.478	.755	Rock River, Ill.
26	.....	.200	.....	.....	.....	.....	.....	.....	Shell Bed. R. Island.
27	.483	.170	.125	.140	936	.076	.388	.735	Albany, Ill.
28	.....	.177	.135	.140	.....	.....	.....	.732	"
29	.507	.177	.130	.145	1137	.068	.440	.734	"
	.508	.179	.184	.140	1188	.075	.432	.755	Mean.
	18	24	23	21	15	14	14	22	No. of skulls measured.

Sioux Skulls.

1	.590	.180	.138	.145	1319	.085	.416	.766	Died in captivity
2	.533	.183	.140	.150	1234	.077	.415	.765	at Davenport,
3	.507	.177	.136	.140	1224	.082	.463	.768	Iowa.
	.512	.180	.138	.145	1256	.081	.431	.766	Mean.
	3	3	3	3	3	3	3	3	No. of skulls measured.

Table IV.

This table shows the measurements of seven Mound-builder's tibia with an Indian tibia, being one of the mutilated bones mentioned above, as found near the surface of mound No. 3, and in connexion with glass-beads, fire steel, clay pipe, etc.—in decimals of a metre.

No.	Transverse D. Proximal end.	Least circumference.	Length.	Antero-posterior diameter.	Transverse diameter of shaft.	Perimetral index.	Latitudinal index.	Remarks.
1	Broken.	.080	.338	.036	.022		.611	Albany, Ill.
2	.078	.074	.298	.038	.024	.400	.631	" "
3	Broken.	.075	.401	.042	.023		.547	" "
4	.076	.362	.580	.040	.026	.192	.660	" "
5	.074	.076	.392	.049	.023	.188	.575	" "
6	.076	.082	.400	.038	.023	.180	.571	Rock River, Ill.
7	.082	.084	.406	.040	.026	.197	.580	Pipe Creek, Iowa.
	.077	.080	.287	.049	.023	.195	.505	Average.
	Broken	.075	.375	.036	.021		.535	Indian from md. 6.

Evidence of the prevalence of Syphilis was quite abundant in the shape of nodes. One skull from an Albany mound, was of so great weight and thickness, and in such an extraordinary state of preservation as to suggest the idea of the individual having been affected with Rickets during life.

Some evidence of a singular disease of the spinal column, affecting in most instances the smaller articulations of the cervical vertebrae, was found and would indicate a variety of disease not much seen now.

In two cases the disease affected the lower, left hand lateral articulation of the second cervical vertebra, or dentata, the articular surfaces in each instance were much roughened and made wider by bony matter thrown out around them, while the corresponding arch of the vertebrae had been shortened. The state of the surfaces showed plainly that the individual must have lived a long while after the joint was attacked, (*how he could have lived at all is a mystery*).

In a third instance, the smaller or lateral joints of the 2d, 3d, 4th, and 5th cervical vertebrae were affected, and the individual had lived long enough for cure by ankylosis to have taken place, also their vertebrae being firmly united as if of one bone, a very unsatisfactory state for the patient, certainly. One of these specimens was from Albany, and the second and the third from Rock River.

If the rondelle of bone (Plate VII, fig. 8), herewith exhibited, (which evidently comes from the squamous part of the temporal bone) was taken during life, it would indicate the existence of trephining known to have been practiced by the pre-historic men of France. The finding

at some future period, of a cranium with the healed edge of the cut, would settle this question.

But the most singular manifestation of disease was discovered in the cervical vertebrae, shown in a peculiar roughening of the articular surfaces, and also of true or bony ankylosis.

It was first noticed in the dentata or second vertebra, found at Rock River. Here the lower articular surface on the left side was affected.

Upon looking over some vertebrae from the Albany mounds, another dentata was found, in which the same surface [the lower one on the left side], was affected.

In a third instance from a Rock River mound, the 2d, 3d and 4th vertebrae are firmly ankylosed together, and the disease extended further down, as the lower surface of the left lower articular surface of the 4th vertebra shows where it was united by bone to the 5th, how much further it extended is not known, as the other bones were lost.

In another case, also from a Rock River mound, the 2d, 3d and 4th vertebrae; were affected, the articular surfaces roughened and some united by being ankylosed here again the disease extended below, but the other bones were lost. In all these cases the skeletons were those of adults, indeed one was of extreme old age, from the loss of teeth and the absence of the alveolar processes. Neither in this instance nor in any of the others, were any signs of disease observed in any of the other bones, besides the cervical vertebrae.

This is certainly not a common form of disease at present, and although rare, the instances of cure by bony ankylosis, (the only way in which a real cure can take place) are even yet more rare, Nelaton in his *Pathologie Chirurgicale*, only being able to note twenty-five recorded cases of such an event.

Now as the space of one year is the shortest possible time allowed by authorities for such a cure to take place, and as during all this time the parts must be kept absolutely at rest, and hence the person, so affected, be entirely helpless, the inference is strong that these people could not have been in the savage state. They must necessarily have been in such a condition in the progress of civilization, as to be possessed of an accumulation of food, the requisite leisure of persons nursing the sick, and dwellings sufficiently comfortable to protect them from the inclemency of the weather in this latitude; without these elements of civilization these persons would of necessity have perished.

From an examination of the condition of the surfaces and edges of the axes, it may be inferred, that not one of them had ever been in use as an implement; thus affording another strong argument for the theory, which places most of these copper articles rather in the category of ornaments, or perhaps, more truly speaking of treasures, than in that of tools.

The wrapping up of some of these axes in a perfect envelope or sack

of cloth would also indicate that they were regarded in the light of treasures. The terra-cotta pulley exhibited was doubtless used in a stone-drill, as suggested by Mr. Rau in his article on stone-drilling without metal.—(*Smithsonian Report*, 1868.)

The false grizzly bear's tooth seems to point to a rather advanced state of civilization, certainly of art, for people use natural ornaments, such as gems, long before they are prompted by an improved taste, or are skilled enough in the arts, to imitate them.

Hieroglyphics observed in Summit Canon, Utah, and on Little Popo-agie River in Wyoming.

BY J. D. PUTNAM.

While in Utah last summer, Mr. B. F. Johnson pointed out to me some hieroglyphics within the mouth of summit canon, about a mile east of Santaquin, Utah county, and extending for about a mile up the canon. They are engraved on the smooth exposed surface of detached boulders of a hard, dark-colored rock, from one to ten feet in diameter. The engraving seems to have been done with some rather blunt-pointed instrument, as the figures have the appearance of being pricked in, not scratched or cut. They are generally, but not always, rather coarse, and being quite shallow, they are often difficult to discern. All observed were on the north side of the canon and on the southern face of the boulders. The canon here cuts through what appears to be an immense glacial morain which extends along the western slopes of the groups of mountains, culminating in Mount Nebo.

Mr. Johnson says that when he came there, over twenty-five years ago, they appeared as old as they do now. Originally there were a good many more, which have been broken up and carried off for building stone, etc. I was unable to obtain any further information regarding their origin or meaning. Mr. Johnson says that similar carvings are not uncommon in southern Utah, where he has also seen them painted in colors. Indian mounds are quite common in different parts of Utah, but I was unable to examine any. The pottery, etc. found in them seems to bear a considerable resemblance to that now made by the Moquis Indians of Arizona. Judging from a few specimens given in Hayden's Report, these hieroglyphics are also much like those of the Moquis. According to the Mormons, the Moquis once were a large and powerful tribe occupying the plains of Utah, but the Piedies and Utes overwhelmed them and they were driven South, until they took refuge in the almost inaccessible canons, where the small remnant still reside. It has been suggested that perhaps there may be some connection between these Moquis Indians and our so-called Mound Builders.

Summit Canon is still used to some extent by the Ute Indians, in

passing from Utah Lake to Thistle Valley. The inscriptions may possibly have been made to mark the entrance to the pass, or the cañon may have been used as a place of retreat in time of danger. In several places it forms a narrow gorge, so that a very small number could defend it; and in the upper part there is plenty of game and grass. Several of the inscriptions would seem to indicate that game of various kinds had been abundant in the vicinity. On a large boulder, about the center of the group, is a very elaborate hunting scene, (Plate XXVIII, fig. 1). The animals represented are probably mountain sheep, though they look more like goats. Three men are engaged in a hunt. The geometrical figures above are probably intended as a record of thanksgiving, and possibly the sun and the moon may be meant by some of the figures. These carvings of animals are the best executed of the whole lot. The entire figure covers a space of about five by six feet.

On another boulder, (No. 2), are represented several other animals on a larger scale, three of these, apparently a beaver, a bear and some other animal are quite plain. The figure of a man has two zigzag lines extending upwards and one to the right. Similar zigzag lines occur frequently among the inscriptions, (No. 5, 6, 7, 8), and are probably meant for snakes, which are also represented coiled up, (No. 6, 7, 9, 10). The snake therefore seems to have been a favorite symbol. The animal on No. 4, I take to be intended for an elk, but it is rather coarse. The upper figures may be meant for a tree, and that on the left, for a man. Man is represented on different boulders by a variety of forms, (No. 1, 2, 3, 4, 6, 8, 12, 13, 14, etc.,) some of which are not very certain. No. 6 must represent some very important person, as it is unusually well done, and is accompanied with coiled and uncoiled snakes. I cannot even guess at the meaning of any of the other inscriptions. No. 10 is quite elaborate. Each number indicates a separate boulder. They were sketched hastily in my note book, on the afternoon of August 12th. 1875, and may not always be perfectly exact, but they will probably serve to give a fair idea of the character of the carvings.

LITTLE POPO-AGIE RIVER, WYOMING.

On the morning of June 29th, 1873, just as we were breaking our camp on the Little Popo agie, we discovered a large number of hieroglyphics coarsely cut in a nearly vertical cliff of buff sandstone, immediately in the rear of Murphy's Ranch. Several members of the party made rough sketches of what they could see.

Prof. Comstock in his Report on the Geology of Captain Jones' Expedition to Northwestern Wyoming in 1873, mentions these hieroglyphics, and some figures are there given.

In September, I again stopped over night here and just as the sun was rising in the morning, I had a very fine opportunity to examine them, and was able to make out many figures we did not see before,

and roughly drew them in my note book. (Plate XXVII). The numbers show the order in which they occurred on the cliff, No. 1 being the most to the left. Nos. 1 to 6 are quite closely connected. The principal cracks in the rocks are shown in the drawing. No. 6 probably records some important historical event or battle. Mr. Murphy, who has lived near by for a number of years, thinks it represents an attack on some frontier military post—possibly the massacre of Fort Phil. Kearney, in 1859. The left hand figure he says represents the Indian town which they left by a trail indicated by a row of dots, and the right hand figure is the Fort, which was attacked. The men on horseback represent cavalry, and those on foot infantry. The marks between the figures and the fort represent the killed and wounded, where a battle was fought. The large figure in No. 4, he says, represents the sun, and the figures with five branches which are found in several places, are hands held up in worship. These figures are probably not very ancient as the rock is not remarkably hard. This locality though on the Shoshone Reservation is very frequently visited by various bands of the Arapahoes and Sioux while on their marauding raids.

DAVENPORT, DECEMBER, 1875.

Summer Botanizing in the Wasatch Mountains, Utah Ter'y.

A LETTER ADDRESSED TO PROF. ASA GRAY,

BY C. C. PARRY.

Professor Asa Gray—

DEAR SIR: The interest you have been pleased to take, for many years past, in my botanical explorations in Western North America, suggests the propriety of addressing to you the following brief sketches of summer botanizing in the Wasatch, during the past season—1875. Although the early botanical collections of Nuttall, Fremont, Stansbury, H. Engelmann, and others, over this and adjoining districts, together with the later very thorough examinations by Mr. Sereno Watson, the results of which are embodied in the Botanical Report, King's Geological Exploration of the 40th Parallel, Vol. V, left little to expect in the way of discovery of new species, I was nevertheless desirous of making a somewhat continuous series of observations from the Eastern Rocky Mountain District, with which I was tolerably familiar, to the Pacific coast, and especially of noting the geographical range of the *Conifera* from East to West.

Accordingly, in the latter part of June, reaching the Salt Lake basin, I selected a location near the head of Lake Utah, not far from the high culminating point of the Wasatch range known as Mount Nebo. Owing to the lateness of the season, the scanty spring verdure of the plains and foot-hills had mostly given place to the dull brown

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of summer, partially relieved, however, by the patchy green of the scrub-oak (*Quercus undulata*, Torr.) on the hill-sides and the tule bogs and grassy swales adjoining Spring Lake, near which were agreeably located the flourishing orchards and gardens of our friendly host, B.F. Johnson, Esq.

My scientific associate on this as well as two previous seasons, J. Duncan Putnam, found congenial employment in extending his knowledge of Rocky Mountain entomology, as well as keeping up a continuous meteorological record.

My first ascent of the high mountain ridge adjoining Spring Lake on the east was made on the 1st of July. Soon after leaving the valley, the steep gravelly slope, marking the ancient lake margin, gives place to the abrupt foot-hills scantily clothed with low tufted plants and straggling shrubs, conspicuous among the latter being *Cowania Mexicana*, *Cercocarpus parvifolius* and *Cercocarpus ledifolius*, var. It was not till after a lively climb of 1500 feet or more that there was any essential change in the monotonous floral features; but with the occurrence of scattered balsam firs (*Abies concolor*), indicating a more copious precipitation of moisture, a much greater freshness of vegetation was apparent, and several familiar mountain forms made their appearance, including *Sphaeralcea acerifolia*, *Mitella trifida*, *Viola canina*, etc. In the deep ravines on either hand, generally dry, there was a choked up growth of scrub-maple (*Acer grandidentatum*), *Rosa*, *Prunus*, and other plants affecting moist locations. Above this comes in a denser growth of *Abies concolor* mixed with *Abies Douglassi*, forming regular forests. We pass occasional groves of Mountain Mahogany (*Cercocarpus ledifolius*), here frequently attaining a height of 25 feet, with low stocky trunks often a foot in diameter. The main ridge, having an elevation of not less than 2500 feet above the valley, forms a sharp rocky crest, dropping off with a still more abrupt slope to the east upon an irregular broken country, cut up by ravines and ridges, extending toward the head waters of the San Pete, one of the main north-eastern tributaries of the Sevier River. Following the main ridge to the south, by a series of abrupt ascents a still greater elevation is reached, commanding extensive views of the Utah basin.

At these higher points, the purple-coned steeple-pointed balsam-fir makes its appearance, plainly identical with the common Rocky Mountain species heretofore designated by Dr. Engelmann as *Abies grandis*, Lindl., but now regarded as a distinct species near to *A. balsamea*, L., viz: *Abies occidentalis*, Engel. ined. The western range of this species is not yet fully determined, as it has not, so far, been authentically traced west of the Wasatch.

At this point a wasting snow-drift, which a week later would have entirely disappeared, offered the only supply of water met with on our route, which was accordingly improved to give relish to our pocket-lunch. Near its borders grew a belated patch of bright yellow violets

just in full bloom; this which seems intermediate in character between *Viola Nuttallii* and *V. pedunculata*, has been noted by Mr. Watson as *V. Nuttallii*, var. *venosa*, but is now referred by him to the Californian species, *V. aurea*, Kellogg, as a variety.

Quite common along the ridge was the well-marked *Orthocarpus Tolmei*, Hook., just coming in flower, which we afterwards found abundant on all the high ridges in this vicinity, continuing to send out flowering branches till checked by early frost. Besides the above noted, few other plants are deserving of special mention on this our first mountain reconnaissance. One main object of our trip was to determine definitely the important practical question whether the fruiting of *Abies* was strictly biennial, or, in exceptional cases, annual. I had noted in 1874, the abundant seeding of *Abies* all over this district, extending to the Eastern Rocky Mountains, but now not a single developing cone could be met with in passing through extensive forests of *Abies concolor*, this condition also holding good of other species. The same fact has also been noted by the enterprising collector, J. G. Lemmon in the Sierra Nevada, so that it may be definitely stated, for the benefit of future collectors, that only on *even years* can *Abies* be relied on for a seed crop. The only exception thus far known to me, occurs in the Coast Range, in Mendocino county, California, from which point fresh fruiting cones were sent of what purported to be *Abies grandis*, gathered in 1875.

Immediately succeeding this first mountain trip, the lower foothills and marshy ground adjoining Spring Lake offered a few interesting points of observation. My attention was first directed to a form of *Cercocarpus*, quite common on dry rocky slopes, which seems to be the same as what has been lately characterized by Mr. Watson as *C. intricatus*, n. sp. I had previously, in 1874, casually examined this plant, and made scanty collections, regarding it as a depauperate variety of *C. ledifolius*. This view was fully confirmed the present season by being able to trace out a regular series of intermediate forms in habit and foliage, as a general thing determined by the nature of the soil, or degree of moisture; thus whenever the circumstances were unfavorable to vigorous growth, the plant exhibited a stunted, snarled and starved appearance with narrower closely revolute leaves, representing *C. intricatus*, while on richer soil, or higher and moister localities, the ordinary form of *C. ledifolius* was exhibited. It may be worth noting here, that the exceedingly close heavy texture of the wood, which has given rise to the popular name of "Mountain Mahogany" for this species, is in great measure injured for any useful appliances by a tendency to season-crack, even when carefully protected from exposure, so that it is impossible to obtain solid blocks.

Other characteristic plants met with on the foothills were *Ceanothus velutinus*, *Hedysarum Mackenzii*, *Zauschneria Californica*, *Pentstemon Eatonii*, *Eriogonum racemosum*, and occasional thick mats of *Wood-*

sia Oregana. My attention here was also drawn to a species of *Echinosperrum* quite common in gravelly debris at the outlet of ravines. This has been noted in all recent collections and descriptive lists as *Echinosperrum deflexum*, var. *floribundum*. Having frequently observed and collected the typical species as figured in Hook. Fl. Bor.-Am., I felt confident that the plant here met with was quite distinct, and I was confirmed in this opinion by meeting later with genuine specimens of the true *E. deflexum*, thus furnishing the means for direct comparison. My notes and specimens not being now accessible, I can only indicate the chief points of difference serving to distinguish our Utah plant, viz: Perennial (not biennial). roots; slender sub-decumbent flowering stems; irregular prickles on the dorsal face of the nutlets. Should this diagnosis be confirmed by farther observation, our species may bear the name, *Echinosperrum subdecumbens*.

Along the numerous water courses, which originate in copious clear springs breaking out at the base of the mountain ridge near Spring Lake, and which have been collected into a respectable pond for irrigating purposes, there is a rank growth of aquatic plants represented mainly by eastern forms, including *Eupatorium purpureum*, *Rumex maritimus*, *Alisma Plantago*, and *Sagittaria variabilis*. The more exclusive western aspect is exhibited in *Parnassia parvifolia*, *Erythraea Douglasii*, and *Epipactis gigantea*. Everywhere in flowing brooks and springs the European water-cress floats on the surface; still comparatively rare in the Eastern States, it seems to have found a congenial home in the far west and is now to be found in nearly every spring through the interior basin and on the Pacific coast!

In the frequent presence of these common eastern forms it seems somewhat strange not to meet with any representative of the pond-lilies, *Nuphar*, *Nymphaea*, or *Nelumbium*, in the numerous muddy lagoons and lake margins, bordered everywhere by *Scirpus*, *Typha*, etc. Evidently the lack of natural means for transporting seed accounts for this fact, which is likely at no distant day to be supplied by human agency.

On the 14th of July the higher mountain districts were accessible, the heavy snow slides of the previous winter being so far diminished as to render the mountain roads passable; accordingly with necessary bedding, provision, and botanical portfolio securely lashed to the running-gear of a lumber wagon, we followed the rough track leading up Summit Canon to the upper saw-mills near the base of Mount Nebo. On reaching the precipitous wall of limestone rock which confronted us like an impassable barrier, the peculiar flora of the district made its appearance. Threading a rude defile along the edge of a dashing mountain stream, the rocks on either hand rise to a dizzy height, and perched in inaccessible crevices, tempting clumps of *Luphamia Stansburiana*, *Tanacetum diversifolium*, and *Heuchera rubescens* everywhere met the eye. At a greater elevation the rocks dipping quite sharply in

the direction of our route, these coveted plants were accessible to our botanical clutch, and copious specimens were soon transferred to our portfolio, during the necessary pauses while the laboring team panted up the steep rocky ascent.

Little snow-fed rills on either hand slid over the polished rocks, or dashed in miniature cataracts, marking the bed of a winter avalanche. In one of the largest of these side-ravines scooped out of the steepest recesses of the mountain wall, the remains of a snow-slide lay directly across our track. The snow, rapidly wasting in the warm rays of a mid-summer sun, was strewn with crushed fragments of the vegetation and rocks that were gathered in its course. At several points we were shown places made memorable by the loss of men and animals overwhelmed and buried beneath these treacherous accumulations of winter storms. Along the track of these snow-slides some of the best botanizing was brought to view, in belated tufts of *Pellaea Breweri*, clinging tenaciously to rock-crevices. Just coming into flower the charmingly fragrant *Monardella odoratissima* was conspicuous, and loosely attached to masses of saturated moss occurred extensive beds of *Aquilegia flavescens*, evidently owing its preservation in such precarious situations to its facility for being moved and replanted under similar conditions, as well as to a copious production of seed. Higher up the chasm was found *Crepis mucronata*, associated with *Habenaria dilatata* and *Carex festuca*; also strangely remote from its high northern and European habitat grew thrifty tufts of *Aspidium Lonchitis*.

Farther up in the passage of this rocky defile, an ascent of about 2000 feet in a distance of two miles brings us to a more open country, where the ridges on either hand rise in more rounded but still quite abrupt slopes; here the scattering coniferous growth is composed mainly of *Abies Douglasii*, *A. concolor*, *A. occidentalis*, and occasional trees of *A. Engelmanni*, this prevalent evergreen growth alternating with thick copses of aspen poplar, and along the stream-courses with alder, birch and willow thickets. Here the unusual freshness of vegetation, due to a prevalence of mountain fog and summer rains, is evidenced in the usually high mountain forms including *Aconitum nigrum*, *Cardamine cordifolia*, *Heracleum lanatum*, *Saxifraga astivalis*, *Geranium Richardsonii*, *Mertensia Sibirica*.

From our mountain camp, pleasantly located on the borders of a clear dashing stream, the higher alpine ridges were accessible by a comparatively easy day's climb.

After due caution from my friendly lumbering comrades to "look out for bears and panthers," I made an early start armed only with a botanical portfolio, a large sheath knife for digging, and a pocket lunch. Rough logging roads leading by steep grades to detached groves of *Abies Engelmanni*, which under the common name of "white pine" is the most valued lumber product of this district, afforded the easiest route to the bald ridges above. On the route, *Sorbus Americanus*,

then in full flower, was conspicuous, and higher up a familiar looking eastern *Lonicera* (*L. ciliata*), made its appearance. Where snow-drifts had lately disappeared the delayed vegetation afforded fine flowering specimens of *Erythronium grandiflorum*, which had long since gone to fruit in the lower valleys. *Aquilegia coerulea* was frequent here, invariably with white flowers, and more rarely we encountered the elegant alpine climber, *Olematis* (*Atragene*) *alpina*. On all the slopes covered with rich soil there was a profuse growth of *Epilobium angustifolium*, reaching to the arm-pits, mixed with which in damp exposures was an equally rank growth of *Mertensia Sibirica*. Not unfrequent in aspen copses we also find *Ligustrum filicinum*, Watson, formerly confounded with *L. scopulorum*.

On the bald alpine slopes there was less variety than I hoped to find; none of the neat Rocky Mountain clovers, no tufted saxifrages nor alpine *Pedicularias*, only a single *Castilleja* (*C. pallida* var.), and a straggling *Silene* (*S. Douglasii*), but as a partial reward for such deficiencies I was fortunate in meeting with abundant flowering specimens of *Synthlipsis pinnatifida*, and a neat yellow-flowered *Eriogonum*, *E. chrysocephalum*, recently described in Proc. Am. Acad. Vol. XI, p. 101.

A subsequent visit later in the season to the direct northern slope of Mt. Nebo revealed a somewhat richer flora, including most unexpectedly large patches of *Primula Parryi* growing on gravelly slopes quite out of the range of alpine streams, though probably covered late with an accumulation of winter snow. At the time of my visit, August 22d, it was in fruit, its capsules already open, and with mature seeds. Associated with this may also be noted *Ranunculus adoneus*, *Arenaria biflora*, *Senecio Fremontii*, etc.

The paucity of the high alpine flora in this section is doubtless to be accounted for by the absence of constant water-courses; no persistent bodies of snow remaining through the late summer months to give origin to those alpine brooks which elsewhere support such a varied and attractive array of floral forms.

It was therefore found advisable to locate our permanent mountain camp at a lower elevation, where numerous springs breaking out along the course of deep ravines gave issue to clear ice-cold mountain brooks, supporting the greatest variety of attractive vegetation.

Among the plants here brought to view in various rambles during the month of August may be mentioned *Gentiana heterosepala*, taking the place of *G. amarella*, var. *acuta*, in the Eastern Rocky Mountain district; a variety of *Pentstemon glaucus*, with deep maroon colored flowers; *Circaea alpina*, a common eastern species not before credited to this region; *Stellaria crassifolia*, forming dense leafy cushions on the mould of decayed wood; *Osmorrhiza brevistylis*, together with several other undetermined *Umbelliferae*; *Galium bifolium*, Watson, and in a single locality on the slope of a brick-red gravelly hill occurred large patches of *Ivesia Gordoni*, associated with a suffruticose *Pentstemon*

(*P. Kingii*, Watson?), and large bushy clumps of *Wyethia amplexicaulis*. The tangled undergrowth is largely made up of the common red raspberry (*Rubus strigosus*), and the more showy *Rubus Nutkanus*, both fruiting abundantly; later in the season *Aster elegans*, var. *Engelmanni*, is conspicuous, its rather coarse habit and large white flowers hardly deserving the appellation implied in the specific name; as a rarity may be noted *Prosartes trachysperma*, Watson, with deep orange or bright scarlet fruit, loosely attached to its decaying stems. Everywhere on dry hill-slopes occurs the rather showy *Lophanthus urticifolius*, and along the borders of streams the singular *Rudbeckia occidentalis* with its deep purple teasel-like head is frequent.

Among the plants affecting rocky locations, the most eagerly watched and the latest to flower was the remarkable *Spiraea caespitosa*, Nutt. Popularly known under the appropriate common name of "tree moss," it spreads its closely matted foliage over the face of bare rocks, insinuating its taproots abundantly garnished with terminal fibers into the narrowest crevices, to which it adheres with a grip almost as tenacious as the rock itself; only when accidentally it has taken root in a coarse gravelly debris can it be successfully removed with its terminal fibrous roots. The main stem, often attaining a thickness of an inch or more, divides horizontally into radiating gnarled branches, which send off from the axils of the primary leaves numerous leafy rosettes by which the growth of the plant is maintained, and from the axis of which the slender bracted flower stems arise. These stems from 3 to 6 inches high are crowned for about one-third of their length with a dense cylindrical spike of small white flowers, with exserted style and stamens, set in a light green tomentose calyx. In thrifty specimens these flowering spikes are occasionally branched. The prostrate growing shoots whenever they light upon a suitable crevice strike root and thus help to maintain the growth of the parent plant; where these favorable conditions are wanting, the whole plant often covering several square feet can be lifted up, showing on the under surface the remains of dead leaves, in the decaying mould of which moisture is retained to keep up the fresh verdure of the young twigs. It seems to flourish best on the north side of exposed limestone rocks occupying a considerable range of altitude above the lower foot-hills, choosing by preference the rugged slopes of moderately steep canons. Its flowering period is earliest on the higher elevations, continuing from the latter part of August to the first of October. The peculiar adaptation of this plant for ornamental rock-work can be appreciated by those who have once seen it in its native haunts, and it is hoped that from plants and seeds somewhat copiously collected it may eventually find a much larger number of admirers in gardens devoted to this charming class of horticultural adornments.

Among other associated rock-plants late in the season, is a dwarf white flowered *Aster*, with glossy lanceolate leaves, occasionally

aerrate, and foliaceous spreading involucre scales. Though doubtfully referred to *A. integrifolius*, Nutt., it is more probably an undescribed species, which can only be safely determined on a revision of this large and polymorphous genus. In similar situations we also meet with *Erigeron flagellaris*.

The forest growth of this district is quite limited, as before indicated; the scarcity of the common Rocky Mountain yellow pine (*Pinus ponderosa*), and the less valuable *Pinus contorta*, serves to diminish materially the lumber products, and the scattered growth and inferior quality of such as are attainable render the labor of the lumbermen exceedingly arduous and poorly remunerative. In this connexion may be noticed the not infrequent occurrence of the parasitic *Arceuthobium Americanum*, which is here met with attached indifferently to *Abies Douglasii*, *A. occidentalis* and *A. concolor*, though in the Rocky Mountain districts it is found quite exclusively confined to *Pinus contorta*.

Taken as a whole, the Flora of this district must be regarded as extremely meagre, and a fit representative of that forbidding soil and rigorous climate best adapted for an isolated civilization in which such strange social problems as Mormonism may be worked out with least disturbance of the general weal.

Respectfully yours,

C. C. PARRY.

SAN BERNARDINO, CALIFORNIA, February, 1876.

LIST OF PHÆNOGAMOUS PLANTS,

Collected in the vicinity of Davenport, Iowa, by J. J. Nagel and
J. G. Haupt, during the years 1870 to 1875, inclusive.

But few localities in the west have been so frequently and thoroughly explored by competent botanists as that of Davenport and vicinity. As early as 1848, Dr. C. C. Parry began extensive collections of the indigenous plants of this locality. (See Owen's Report on the Geology of Wisconsin, Iowa and Minnesota, p. 606). Since that time valuable collections have been made by Prof. D. S. Sheldon of Griswold College, Mr. Serano Watson of Cambridge, the late Mr. Alfred Sanders of this city, and more recently, Mrs. E. A. Graham, instructor in Botany in the Training department of our city schools. These collections embrace a number of species no longer to be found in this locality, but as will be seen from the following list of plants recently collected, comparatively few species have disappeared while a number have become naturalized and others have been sparingly introduced, of which the older collectors make no mention. In preparing this list we have conformed to the 5th ed. of Gray's Manual. With a few exceptions all the plants mentioned are preserved in the herbarium of the Academy, which now contains over two thousand species.

Ranunculaceæ.

Clematis Pitcheri, T. & G.	Leather-flower.	June.
"	Virginiana, L.	Common Virgin's Bower. July.
Anemone Caroliniana, Walt.	Carolina Anemone.	May.
"	cylindrica, Gr.	Long-fruited " "
"	Virginiana, L.	Tall " July.
"	Pennsylvanica, L.	Pennsylvanian " June.
"	nemorosa, L.	Wind-flower. Wood " May.
"	var. quinque folia, Gr.	" "
Hepatica triloba, Chaix.	Round-lobed Hepatica.	April.

<i>Hepatica acutiloba</i> , DC....	Sharp lobed Hepatica.	April.
<i>Thalictrum anemonoides</i> , Mx....	Rue-anemone.	"
" <i>purpurascens</i> , L....	Purplish meadow-rue.	June.
" <i>cornuti</i> L....	Tall " "	July.
<i>Ranunculus, multifidus</i> , Ph....	Yellow water-crowfoot.	May.
" <i>abortivus</i> , L....	Small-flowered " "	May.
" <i>sceleratus</i> , L....	Cursed " "	July.
" <i>recurvatus</i> , Poir....	Hooked " "	June.
" <i>fascicularis</i> , Muhl....	Early " "	April.
" <i>repens</i> , L....	Creeping " "	May.
<i>Caltha palustris</i> , L....	Marsh marigold.	April.
<i>Aquilegia Canadensis</i> , L....	Wild columbine.	May.
<i>Delphinium exaltatum</i> , Ait....	Tall Larkspur.	July.
" <i>azureum</i> , Mx....	Azure " "	June.
<i>Actæa alba</i> , Bigel....	White baneberry.	May.
<i>Magnoliaceæ.</i>		
<i>Liriodendron Tulipifera</i> , L....	Tulip-tree. R. I.	June.
<i>Menispermaceæ.</i>		
<i>Menispermum Canadense</i> , L....	Canadian moonseed.	"
<i>Berberidaceæ.</i>		
<i>Caulophyllum thalictroides</i> , Mx....	Pappoose-root.	April.
<i>Podophyllum peltatum</i> , L....	Mandrake.	May.
<i>Nymphaeaceæ.</i>		
<i>Nymphaea odorata</i> , Ait....	Water-lily.	July.
<i>Nuphar advena</i> , Ait ...	Yellow pond-lily.	"
<i>Sarraceniaceæ.</i>		
<i>Sarracenia purpurea</i> , L....	Side-saddle flower.	June.
<i>Papaveraceæ.</i>		
<i>Sanguinaria Canadensis</i> , L....	Blood-root.	April.
<i>Fumariaceæ.</i>		
<i>Dicentra cucullaria</i> , DC....	Dutchman's breeches.	"
<i>Corydalis aurea</i> , Willd....	Golden corydal.	May.
<i>Cruciferaæ.</i>		
<i>Nasturtium sinuatum</i> , Nutt....	Water-cress.	June.
" <i>obtusum</i> , Nutt....	" "	May.
" <i>palustre</i> , DC....	Marsh cress.	July.
" var. <i>hispidum</i> , Gr....	cress.	"
" <i>Armoracia</i> , Fries....	Horse-radish.	May.
<i>Dentaria laciniata</i> , Muhl....	Pepper-root.	"
<i>Cardamine rhomboidea</i> , DC....	Spring cress.	"
" <i>hirsuta</i> , L....	Common bitter cress.	"
<i>Arabis lyrata</i> , L....	Rock cress.	June.
" <i>dentata</i> , T & G....	Rock cress.	May.
" <i>Canadensis</i> , L....	Sickle-pod.	July.
" <i>Drummondii</i> , Gr....	Tower mustard.	May.
<i>Erysimum cheiranthoides</i> , L....	Wormseed mustard.	July.

Sisymbrium officinale, Scop....	Hedge mustard.	May.
" canescens, Nutt....	Tansy "	"
Brassica Sinapistrum, Bois....	Field "	"
" nigra, Gr....	Black "	July.
Draba cuneifolia, Nutt....	Whitlow grass.	May.
Capsella Bursa-pastoris, Moench....	Shepherd's purse.	April.
Lepidium Virginicum, L....	Wild Peppergrass.	July.
" intermedium, Gr....	Common "	May.

Capparidaceæ.

Polanisia graveolens, Raf....	Polanisia.	July.
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Violaceæ.

Viola blanda, Willd....	Sweet white violet.	May.
" cucullata, Ait....	Common blue violet.	April.
" var. palmata, Gr....	Hand-leaf "	May.
" sagittata, Ait....	Arrow-leaved "	"
" pedata, L....	Bird-foot. "	"
" pubescens, Ait....	Downy yellow "	"
" " var. eriocarpa, Nutt,	" "	"

Cistaceæ.

Helianthemum Canadense, Mx....	Frost-weed.	July.
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Hypericaceæ.

Hypericum pyramidatum, Ait....	Great St. John's Wort.	"
" mutilum, L....	Low " " "	"
" Canadense, L....	Common " " "	"

Caryophyllaceæ.

Vaccaria vulgaris, Host....	Cow-herb.	"
Silene nivea, DC....	Campion.	"
" noctiflora, L....	Night-flowering catchfly.	"
Lychnis Githago, Lam....	Corn-cockle	"
Arenaria lateriflora, L....	Side-fl. Sandwort.	May.
Cerastium vulgatum, L....	Mouse-ear chickweed.	June.
" nutans, Raf....	" "	May.

Portulacaceæ.

Portulaca oleracea, L....	Common purslane.	July.
" retusa, Engelm, ...	" "	"
Claytonia Virginica, L....	Spring beauty.	April.

Malvaceæ.

Malva rotundifolia, L....	Common mallow.	April.
" sylvestris, L....	High "	July.
Malvastrum angustum, Gr....	Dr. C. C. Parry, 1865.	August.
Abutilon Avicennæ, Gtn....	Velvet-leaf.	July.

Tiliaceæ.

Tilia Americana, L....	Bass-wood.	July.
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Linaceæ.

Linum Virginianum, L....	Wild flax.	July.
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<i>Geraniaceae.</i>		
<i>Geranium maculatum</i> , L....	Wild cranesbill.	May.
<i>Impatiens fulva</i> , Nutt....	Spotted Touch-me-not.	July.
<i>Oxalis violacea</i> , L....	Violet wood-sorrel.	May.
" <i>stricta</i> , L....	Yellow " "	June.
<i>Rutaceae.</i>		
<i>Zanthoxylum Americanum</i> , Mill....	Northern prickly ash.	May.
<i>Ptelea trifoliata</i> , L....	Hop-tree.	June.
<i>Anacardiaceae.</i>		
<i>Rhus typhina</i> , L....	Staghorn sumach.	June.
" <i>glabra</i> , L....	Smooth "	"
<i>Vitaceae.</i>		
<i>Vitis cordifolia</i> , Mx....	Winter-grape.	May.
<i>Ampelopsis quinquefolia</i> , Mx....	Virginia creeper	July.
<i>Rhamnaceae.</i>		
<i>Rhamnus lanceolatus</i> , Ph....	Buck-thorn.	May.
<i>Ceanothus Americanus</i> , L....	New Jersey Tea.	July.
<i>Celastraceae.</i>		
<i>Celastrus scandens</i> , L....	Wax-work.	May.
<i>Sapindaceae.</i>		
<i>Staphylea trifolia</i> , L....	American bladder-nut.	"
<i>Aesculus Hippocastanum</i> , L....	Horse-chesnut.	"
<i>Acer saccharinum</i> , Wang....	Sugar maple.	"
" <i>dasycarpum</i>	Ehrh.... White maple.	April.
<i>Negundo aceroides</i> , Moench....	Box-Elder.	"
<i>Polygalaceae.</i>		
<i>Polygala Senega</i> , L.,...	Seneca Snakeroot.	May.
<i>Leguminosae.</i>		
<i>Trifolium pratense</i> , L....	Red clover.	May.
" <i>repens</i> , L....	White "	"
<i>Melilotus officinalis</i> , Willd....	Yellow melilot.	August.
" <i>alba</i> , Lam ...	White "	"
<i>Psoralea floribunda</i> , Nutt....	Psoralea.	"
<i>Petalostemon violaceus</i> , Mx....	Violet prairie clover.	July.
" <i>candidus</i> , Mx....	White " "	"
<i>Amorpha fruticosa</i> , L....	False Indigo.	June.
" <i>canescens</i> , Nutt....	Lead-Plant.	July.
<i>Robinia Pseudacacia</i> , L....	Common Locust.	May.
<i>Tephrosia Virginiana</i> , Pers....	Goat's Rue.	June.
<i>Astragalus distortus</i> , T. & G....	Milk-vetch.	May.
<i>Desmodium paniculatum</i> , DC....	Tick Trefoil.	July.
<i>Lathyrus venosus</i> , Muhl. ...	Everlasting Pea	June.
<i>Apios tuberosa</i> , Moench....	Ground nut.	August.
<i>Baptisia leucantha</i> , T. & G....	False Indigo.	June.
" <i>leucophaea</i> , Nutt....	" "	May.

<i>Cercis Canadensis</i> , L....	Red-bud.	May.
<i>Cassia Marilandica</i> , L....	Wild Senna.	July.
" <i>Chamaecrista</i> , L....	Partridge Pea.	"
<i>Gynocladus Canadensis</i> , Lam....	Kentucky coffee-tree.	June.
<i>Gleditsia triacanthos</i> , L....	Three-thorned Acacia.	"

Rosaceæ.

<i>Prunus Americana</i> , Marshall....	Wild yellow plum.	May.
" <i>Virginiana</i> , L....	Choke-cherry.	"
" <i>serotina</i> , Ehrh....	Wild black cherry.	"
<i>Spiraea salicifolia</i> , L....	Common meadow-sweet.	July.
<i>Agrimonia Eupatoria</i> , L....	Common agrimony.	August.
<i>Geum album</i> , Gmelin....	White Avena.	July.
" <i>strictum</i> , Ait....	Stout yellow avena.	"
<i>Potentilla Norvegica</i> , L....	Spreading cinquefoil.	"
" <i>Canadensis</i> , L....	Common "	May.
" <i>arguta</i> , Ph....	Erect "	July.
<i>Fragaria Virginiana</i> , Ehr. var. <i>Illinoensis</i> , Gr.		May.
" <i>vesca</i> , L....	Wild Strawberry.	"
<i>Rubus occidentalis</i> , L....	Black Raspberry.	"
" <i>villosus</i> , Ait....	Common "	"
<i>Rosa lucida</i> , Ehr....	Dwarf Rose.	June.
" <i>blanda</i> , Ait....	Early "	"
<i>Crataegus coccinea</i> , L....	Scarlet-fr. Thorn.	May.
" <i>tomentosa</i> , L....	Black or Pear Thorn.	"
" " var. <i>pyrifolia</i> , Gr....	Pear Thorn.	"
" " var. <i>mollis</i> , Gr....	"	"
<i>Pyrus coronaria</i> , L....	American crab-apple.	"
" <i>Americana</i> , DC....	mountain-ash.	"

Saxifragacée.

<i>Ribes Cynosbati</i> , L....	Wild Gooseberry.	"
" <i>rotundifolium</i> , Mx....	Smooth wild gooseberry.	"
" <i>floridum</i> , L....	Wild black currant.	"
" <i>rubrum</i> , L....	Red currant.	"
<i>Saxifraga Pennsylvanica</i> , L....	Swamp Saxifrage.	"
<i>Heuchera hispida</i> , Ph....	Alum-root	June.
<i>Mitella diphylla</i> , L....	Bishop's-cap.	May.

Crassulacæ

<i>Penthorum sedoides</i> , L....	Ditch stone-crop.	August
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Onagraceæ.

<i>Circaea Lutetiana</i> , L....	Enchanter's Nightshade.	July.
<i>Epilobium angustifolium</i> , L....	Great willow-herb.	"
" <i>palustre</i> , L. var. <i>lineare</i> , Gr....	Common willow-herb.	Aug
" <i>coloratum</i> , Muhl....	Bright "	"
<i>Oenothera biennis</i> , L....	Evening Primrose.	"
<i>Ludwigia polycarpa</i> , S. & P....	Swamp purslane.	"

<i>Lythraceae.</i>		
<i>Lythrum alatum</i> , Ph....	Common loose-strife.	June.
<i>Cucurbitaceae.</i>		
<i>Sicyos angulatus</i> , L ...	One-seeded star-cucumber.	August.
<i>Echinocystis lobata</i> , T. & G....	Wild balsam apple.	"
<i>Umbelliferae.</i>		
<i>Sanicula Canadensis</i> , L....	Black Snake root.	July.
" <i>Marilandica</i> , L....	" "	June.
<i>Eryngium yuccaefolium</i> , Mx....	Rattle-snake-master.	July.
<i>Polytaenia Nuttallii</i> , DC....	Wild Parsnip.	May.
<i>Pastinaca sativa</i> , L....	Common	July.
<i>Conioselinum Canadense</i> , T. & G....	Hemlock-parsley.	August.
<i>Thaspium aureum</i> , Nutt....	Meadow-parsnip.	June.
<i>Zizia integrerrima</i> , DC....	Zizia.	"
<i>Cicuta maculata</i> , L....	Spotted cowbane.	August.
<i>Sium lineare</i> , Mx....	Water parsnip.	July.
<i>Cryptotaenia Canadensis</i> , DC....	Honewort	June.
<i>Osmorrhiza longistylis</i> , DC....	Smoother Sweet Cicely	"
" <i>brevistylis</i> , DC....	Hairy " "	"
<i>Conium maculatum</i> , L....	Poison hemlock, Brady St. road.	July.
<i>Araliaceae.</i>		
<i>Aralia racemosa</i> , L....	Spikenard, rare.	"
" <i>nudicaulis</i> ,....	Wild Sarsaparilla, rare.	June.
<i>Cornaceae.</i>		
<i>Cornus sericea</i> , L....	Kinnikinnik.	"
" <i>paniculata</i> , L'H....	Panicked Cornel.	"
<i>Caprifoliaceae.</i>		
<i>Lonicera flava</i> , Sims....	Yellow Honey-suckle.	June.
<i>Triosteum perfoliatum</i> , L ...	Horse-gentian.	May.
" <i>angustifolium</i> , L....	" "	"
<i>Sambucus Canadensis</i> , L...	Common elder.	June.
" <i>pubens</i> , Mx....	Red-berried "	May.
<i>Viburnum Lentago</i> , L....	Sheep-berry.	"
<i>Rubiaceae.</i>		
<i>Galium concinnum</i> , T. & G....	Common Bed-straw.	July.
" <i>trifidum</i> , L....	Small " "	June.
<i>Cephalanthus occidentalis</i> , L....	Button-bush.	July.
<i>Compositae.</i>		
<i>Verhonia Noveboracensis</i> , Willd....	Iron-weed	Sept.
<i>Liatris squarrosa</i> , Willd....	Blazing Star.	"
<i>Kuhnia eupatorioides</i> , L....	Kuhnia.	August.
<i>Eupatorium purpureum</i> , L....	Joe-Pye-Weed.	"
" <i>perfoliatum</i> , L....	Bone-set.	"
" <i>ageratoides</i> , L....	White Snake-root.	Sept.
<i>Aster multiflorus</i> , Ait....	Many-flowered aster.	Oct.
<i>Erigeron Canadense</i>	Horse-weed,	August.

<i>Erigeron Philadelphicus</i> , ... Fleabane.	May
<i>Solidago rigida</i> , L.... Upright golden-rod.	Sept.
" <i>ulmifolia</i> , Muhl.... Elm-leaved golden-rod.	"
" <i>rupestris</i> , Raf.... Hardy	"
" <i>Canadensis</i> , L.... Common	"
" <i>serotina</i> , Ait.... Smooth	August.
" <i>gigantea</i> , Ait.... Great	Sept.
" <i>lanceolata</i> , L.... Lance-leaved	"
<i>Staphium integrifolium</i> , Mx.... Rosin-plant.	"
" <i>perfoliatum</i> , L.... Cup-plant.	"
<i>Ambrosia trifida</i> , L.... Great Rag-weed.	"
" <i>artemisiaefolia</i> , L.... Roman wormwood.	"
<i>Xanthium strumarium</i> , L.... Common Cockle-bur.	"
<i>Heliopsis laevis</i> , Pers.... Ox-eye.	August.
<i>Echinacea angustifolia</i> , DC.... Purple Cone-flower.	July.
<i>Rudbeckia hirta</i> , L.... Smaller	"
<i>Helianthus rigidus</i> , Desf.... Sun-flower.	Sept.
" <i>grosse-serratus</i> , Mart.... Large-tooth sun-flower.	"
" <i>hirsutus</i> , Raf.... Hairy	Aug.
<i>Actinomeris squarrosa</i> , Nutt.... Actinomeris.	Sept.
<i>Coreopsis palmata</i> , Nutt.... Hand-leaved Tick-seed.	July.
<i>Bidens frondosa</i> , L.... Common beggar-ticks.	Sept.
" <i>cernua</i> , L.... Bur-marigold.	August.
<i>Dysodia chrysanthemoides</i> , Lag.... Fetid marigold.	July.
<i>Helenium autumnale</i> , L.... Sneezeweed.	August.
<i>Maruta Cotula</i> , DC.... Common May-weed.	July.
<i>Achillea millefolium</i> , L.... Common Yarrow.	June.
<i>Antennaria margaritacea</i> , R. Br.... Pearly Everlasting.	July.
" <i>plantaginifolia</i> , Hook.... Plantain-leaved	May.
<i>Cacalia suaveolens</i> , L.... Common Indian plantain.	Oct.
" <i>tuberosa</i> , Nutt.... Tuberous	July.
<i>Senecio aureus</i> , L.... Golden rag-wort.	May.
<i>Cirsium lanceolatum</i> , Scop.... Common Thistle.	August.
" <i>altissimum</i> , Spreng.... Tall	Sept.
" <i>arvense</i> , Scop.... Canada	July.
<i>Lappa officinalis</i> , All. var. <i>major</i> , Gr.... Common burdock.	Aug.
<i>Cyathium Intybus</i> , L.... Succory or cichory.	July.
<i>Cynthia Virginica</i> , Don.... Cynthia.	June.
<i>Troximon cuspidatum</i> , Ph.... Pale dandelion	May.
<i>Nabalus albus</i> , Hook.... Rattle-snake-root.	Sept.
<i>Taraxacum Dens-leonis</i> , Desf.... Common dandelion.	May.
<i>Lactuca Canadensis</i> , L.... Wild lettuce.	July.
<i>Sonchus oleraceus</i> , L.... Common Sow-Thistle.	"
<i>Lobeliaceae.</i>	
<i>Lobelia cardinalis</i> , L.... Cardinal-flower.	Aug.
" <i>syphilitica</i> , L.... Great Lobelia.	"

<i>Lobelia puberula</i> , Mx....	Slender Lobelia.	Sept.
<i>spicata</i> , Lam....	Pale "	July.
<i>Campanulaceae.</i>		
<i>Campanula rotundifolia</i> , L....	Harebell.	August.
" <i>aparinoides</i> , Ph....	Marsh Bellflower.	"
" <i>Americana</i> , L....	Tall "	"
<i>Specularia perfoliata</i> , A. DC....	Venus' Looking-glass.	"
<i>Ericaceae.</i>		
<i>Vaccinium vacillans</i> , Sol....	Low Blueberry.	June.
<i>Plantaginaceae.</i>		
<i>Plantago major</i> , L....	Common plantain.	"
<i>Primulaceae.</i>		
<i>Androsace occidentalis</i> , Ph....	Androsace.	May.
<i>Dodecatheon Meadia</i> , L....	American Cowslip.	"
<i>Lysimachia longifolia</i> , Ph....	Long-leaved Loose-strife.	July.
<i>Scrophulariaceae.</i>		
<i>Verbascum Thapsus</i> , L....	Common Mullein.	June.
<i>Scrophularia nodosa</i> , L....	Fig-wort.	May.
<i>Pentstemon pubescens</i> , Sol....	Beard-tongue.	"
<i>Mimulus ringens</i> , L....	Monkey-flower.	July.
<i>Herpestis rotundifolia</i> , Ph....	Herpestis.	Aug.
<i>Synthyris Houghtoniana</i> , Benth....	Synthyris.	May.
<i>Veronica Virginica</i> , L....	Culver's-root.	Aug.
" <i>peregrina</i> , L....	Purslane-Speed-well.	May.
" <i>arvensis</i> , L....	Corn "	June.
<i>Gerardia tenuifolia</i> , Vahl....	Slender Gerardia.	Sept.
" <i>auriculata</i> , Mx....	Eared "	August.
<i>Castilleja coccinea</i> , Spreng....	Scarlet Painted-Cup.	May.
<i>Pedicularis Canadensis</i> , L....	Wood Betony.	"
" <i>lanceolata</i> , Mx. "	" "	Sept.
<i>Acanthaceae.</i>		
<i>Ruellia ciliosa</i> , Ph....	Two-winged Acanthus.	August.
<i>Verbenaceae.</i>		
<i>Verbena hastata</i> , L....	Blue Vervain.	"
" <i>urticifolia</i> , L....	White Vervain.	"
" <i>stricta</i> , Vent....	Hoary "	"
" <i>bracteosa</i> , Mx....	Braoted "	Sept.
<i>Phryma Leptostachya</i> , L....	Lopseed.	July.
<i>Labiatae.</i>		
<i>Teucrium Canadense</i> , L....	Wood Sage.	July.
<i>Mentha Canadensis</i> , L....	Wild Mint.	"
<i>Lycopus Europaeus</i> , L....	Water Horsehound.	August.
" <i>var. sinuatus</i> , Gr....	Water Horsehound.	"
<i>Pycnanthemum linifolium</i> , Ph....	Mountain mint.	July.
<i>Monarda fistulosa</i> , L....	Wild Bergamot.	"
<i>Lophanthus nepetoides</i> , Benth....	Giant Hyssop.	Sept.

<i>Nepeta Cataria</i> , L. . . Catnip.	July.
" <i>Glechoma</i> , Benth. . . Ground Ivy.	May.
<i>Brunella vulgaris</i> , L. . . Common Self-heal.	August.
<i>Scutellaria versicolor</i> , Nutt. . . Skull-cap.	July.
" <i>parvula</i> , Mx.	June.
" <i>galericulata</i> , L.	August.
" <i>lateriflora</i> , L. . . . Mad-dog Skull-cap.	Sept.
<i>Stachys palustris</i> , L. var. <i>aspera</i> , Gr. . . Hedge-nettle.	July.
<i>Leonurus Cardiaca</i> , L. . . Common Motherwort.	"

Borraginaceæ.

<i>Onosmodium molle</i> , Mx. . . False Gromwell.	July.
<i>Lithospermum hirtum</i> , Lehm. . . Hairy Puccoon.	May.
" <i>longiflorum</i> , Spr. . . . Long-fl. "	R. I.
<i>Mertensia Virginica</i> , DC. . . . Virginian Lungwort.	"
<i>Echinosperrum Lappula</i> , Lehm. . . Stick-seed.	"
<i>Cynoglossum officinale</i> , L. . . Hound's-tongue.	"
" <i>Morisoni</i> , DC. . . Beggar's Lice.	Sept.

Hydrophyllaceæ.

<i>Hydrophyllum Virginicum</i> , L. . . Water-leaf.	May.
<i>Ellisia Nyctelia</i> , L. . . Ellisia.	"

Polemoniaceæ.

<i>Polemonium reptans</i> , L. . . Jacob's Ladder.	May.
<i>Phlox pilosa</i> , L. . . Hairy Phlox.	"
" <i>divaricata</i> , L. . . Pale "	"

Convolvulaceæ.

<i>Ipomoea purpurea</i> , Lam. . . Common Morning-glory.	August.
" <i>Nil</i> , Roth. . . Small-fl. "	"
<i>Convolvulus arvensis</i> , L. . . Bind-weed. Dr. Iles' residence.	June.
<i>Calystegia sepium</i> , R. Br. . . Hedge Bindweed.	July.
<i>Cuscuta glomerata</i> , Choisy. . . Dense Dodder	Sept.

Solanaceæ.

<i>Solanum nigrum</i> , L. . . Common Nightshade.	Sept.
<i>Physalis pubescens</i> , L. . . Ground Cherry.	June.
" <i>Pennsylvanica</i> , L.	"
<i>Datura Stramonium</i> , L. . . Thorn-apple.	August.

Gentianaceæ.

<i>Gentiana alba</i> , Muhl. . . Whitish Gentian.	Sept.
" <i>puberula</i> , Mx. . . Hairy "	Oct.

Apocynaceæ.

<i>Apocynum androsaemifolium</i> , L. . . Dog-bane.	June.
" <i>cannabinum</i> , L. . . Indian Hemp.	"

Asclepiadaceæ.

<i>Asclepias Cornuti</i> , Dec. . . Common Milkweed.	July.
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<i>Asclepias phytolaccoides</i> , Ph....	Poke- "	June.	
"	<i>purpurascens</i> , L....	Purple "	July.
"	<i>incarnata</i> , L....	Swamp "	"
"	<i>tuberosa</i> , L....	Pleurisy-root.	"
"	<i>verticillata</i> , L....	Whorled Milkweed.	"
<i>Acerates viridiflora</i> , Ell....	Green "	"	"
<i>Oleaceæ.</i>			
<i>Fraxinus viridis</i> , Mx. f....	Green Ash.		May.
<i>Aristolochiaceæ.</i>			
<i>Asarum Canadense</i> , L....	Wild Ginger.		May.
<i>Nyctaginaceæ.</i>			
<i>Oxybaphus nyctagineus</i> , Sweet....	Wild Four-o'clock.		July.
<i>Chenopodiaceæ.</i>			
<i>Chenopodium album</i> , L....	Pig-weed.		July.
"	<i>hybridum</i> , L....	Goose-foot.	"
"	<i>ambrosioides</i> , L. var. <i>anthelminticum</i> , Gr.,		
	Wormseed.		Aug.
<i>Amarantaceæ.</i>			
<i>Amarantus retroflexus</i> , L....	Pigweed.		Aug.
"	"	<i>var. hybridus</i> , Gr....	Green Amaranth. "
"	<i>albus</i> , L....	Pig-weed.	"
<i>Polygonaceæ.</i>			
<i>Polygonum orientale</i> , L....	Prince's Feather.		Aug.
"	<i>Pennsylvanicum</i> , L....	Knot-weed.	Sept.
"	<i>incarnatum</i> , Ell....	Marsh Smartweed.	"
"	<i>Hydropiper</i> , L....	Common "	"
"	<i>Virginianum</i> , L....	Beaked Knot-weed.	Sept.
"	<i>aviculare</i> , L....	Goose-grass, &c.	June.
"	"	<i>var. erectum</i> , Roth....	Goose-grass. July.
"	<i>ramosissimum</i> , Mx....	Tall "	August.
"	<i>Convolvulus</i> , L....	Black Bindweed.	July.
<i>Rumex Brittanicus</i> , L....	Tall Dock.		June.
"	<i>crispus</i> , L....	Curled "	May.
<i>Santalaceæ.</i>			
<i>Comandra umbellata</i> , Nutt....	Bastard Toad-flax.		May.
<i>Euphorbiaceæ.</i>			
<i>Euphorbia maculata</i> , L....	Spotted Spurge.		Sept.
"	<i>hypericifolia</i> , L....	Larger Spotted Spurge.	"
"	<i>corollata</i> , L....	Flowering "	July.
<i>Acalypha Virginica</i> , L....	Three-seeded Mercury.		Sept.
<i>Urticaceæ.</i>			
<i>Ulmus fulva</i> , Mx....	Slippery or Red Elm.		April.
"	<i>Americana</i> , L....	White "	"
<i>Celtis occidentalis</i> , L....	Sugar-berry.		May.

<i>Morus rubra</i> , L....	Red Mulberry.	May.
<i>Cannabis sativa</i> , L....	Wild Hemp.	July.
<i>Humulus Lupulus</i> , L....	Hop-vine.	"

Platanaceæ.

<i>Platanus occidentalis</i> , L....	Sycamore.	May.
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Juglandaceæ.

<i>Juglans cinerea</i> , L ...	Butternut.	May.
" <i>nigra</i> , L....	Black Walnut.	"
<i>Carya alba</i> , Nutt....	Shell-bark Hickory.	"
" <i>sulcata</i> , Nutt....	Common "	"
" <i>porcina</i> , Nutt....	Pig-nut.	"

Cupuliferaæ.

<i>Quercus alba</i> , L....	White Oak.	"
" <i>macrocarpa</i> , Mx....	Bur-Oak.	"
" <i>Prinus</i> , L. var. <i>acuminata</i> , Mx....	Yel. Chest. Oak.	"
" <i>coccinea</i> , Wang. var. <i>tinctoria</i> , Gr....	Black "	"
" <i>rubra</i> , L....	Red Oak.	"
<i>Corylus Americana</i> , Walt....	Hazel-nut.	April.
<i>Carpinus Americana</i> , Mx ...	Hornbeam.	May.

Betulaceæ.

<i>Betula papyracea</i> , Ait....	Canoe Birch.	May.
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Salicaceæ.

<i>Salix sericea</i> , Marshall....	Silky-leaved Willow.	April.
" <i>petiolaris</i> , Smith....	Petioled "	"
" <i>nigra</i> , Marshall....	Black "	May.
" <i>alba</i> , L....	White "	"
<i>Populus tremuloides</i> , Mx....	American Aspen.	April.
" <i>grandidentata</i> , Mx....	Toothed "	"
" <i>monilifera</i> , Ait....	Cotton-wood.	"
" <i>balsamifera</i> , L. var. <i>Candidans</i> , Gr....	Balm of Gilead.	April.
" <i>dilatata</i> , Ait....	Lombardy Poplar.	"
" <i>alba</i> , L....	White "	"

Coniferaæ.

<i>Thuja occidentalis</i> , L....	Arbor Vitæ.	July.
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Araceæ.

<i>Arisæma triphyllum</i> , Torr....	Indian Turnip.	May.
" <i>Dracontium</i> , Schott...	Dragon-root.	"

Typhaceæ.

<i>Typha latifolia</i> , L....	Common Cat-tail.	July.
<i>Sparganium eurycarpum</i> , Engelm....	Bur-reed.	"

Alismaceæ.

<i>Alisma Plantago</i> , L. var. <i>Americanum</i> , Gr.		July.
<i>Sagittaria variabilis</i> , Engelm....	Arrow-head.	"
" <i>heterophylla</i> , Ph....	" "	"

Orchidaceæ.

<i>Liparis liliifolia</i> , Richard. . . .	Twayblade.	June.
<i>Cypripedium candidum</i> , Muhl. . .	Small White Lady's Slipper.	May.
" <i>parviflorum</i> , Salisb. . .	Yellow " " "	"
" <i>pubescens</i> , Willd. . . .	Larger " " "	"

Amaryllidaceæ.

<i>Hypoxys erecta</i> , L. . . .	Star-grass.	May.
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Iridaceæ.

<i>Iris versicolor</i> , L. . . .	Larger Blue Flag.	June.
<i>Sisyrinchium Bermudiana</i> , L. . .	Blue-eyed Grass.	May.

Smilacææ.

<i>Smilax herbacea</i> , L. . . .	Carrion-Flower.	May.
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Liliaceæ.

<i>Trillium recurvatum</i> , Beck. . . .	Three-leaved Nightshade.	May.
<i>Uvularia grandiflora</i> , Smith. . .	Large-fl. Bellwort.	"
<i>Smilacina racemosa</i> , Desf. . . .	False Spikenard.	"
" <i>stellata</i> , Desf. . . .	False Solomon's Seal.	"
<i>Polygonatum biflorum</i> , Ell. . . .	Smaller " "	"
" <i>giganteum</i> , Diet. . . .	Great " "	June.
<i>Lilium Philadelphicum</i> , L. . . .	Wild Orange red Lily.	"
" <i>Canadense</i> , L. . . .	Yellow " "	July.
<i>Erythronium albidum</i> , Nutt. . .	White Dog's-tooth Violet.	May.
<i>Scilla Fraseri</i> , Gr. . . .	Wild Hyacinth.	"
<i>Allium Canadense</i> , Kalm. . . .	Wild Meadow Garlic.	June.
" <i>striatum</i> , Jacq. . . .	Striped " "	May.

Commelynaceæ.

<i>Tradescantia Virginica</i> , L. . . .	Common Spiderwort.	May.
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Cyperaceæ.

<i>Eleocharis palustris</i> , R. Br. . . .	Spike-rush.	May.
" " <i>var. glaucescens</i> , Gr. . .	Spike-rush.	"
<i>Scirpus validus</i> , Vahl. . . .	Great Bulrush.	June.
<i>Caex stricta</i> , Lam. . . .	Sedge.	August.

**List of Land and Fresh Water Shells found at Davenport,
Iowa.**

W. H. PRATT.

UNIONIDÆ.

Unio Aesopus,	<i>Green.</i>	•	common.
alatus,	<i>Say.</i>		abundant.
anodontoides,	<i>Lea.</i>		abundant.
asperrimus,	<i>Lea.</i>		common.
capax,	<i>Green.</i>		rare.
Cooperianus,	<i>Lea.</i>		rare.
cornutus,	<i>Barnes.</i>		abundant.
crassidens,	<i>Lamarck.</i>		rather rare.
Dorfeuillianus,	<i>Lea.</i>		very rare.
ebenus,	<i>Lea.</i>		abundant.
elegans,	<i>Lea.</i>		common.
ellipsis,	<i>Lea.</i>		abundant.
gibbosus,	<i>Barnes.</i>		common.
gracilis,	<i>Barnes.</i>		common.
laevissimus,	<i>Lea.</i>		common.
ligamentinus,	<i>Lam.</i>		common.
luteolus,	<i>Lam.</i>		common.
metanevrus,	<i>Rafinesque.</i>		abundant.
monodontus,	<i>Say.</i>		common.
multiplicatus,	<i>Lea.</i>		very rare.
mytiloides,	<i>Raf.</i>		common.
occidens,	<i>Lea.</i>		common.
orbiculatus,	<i>Haldeman.</i>		common.
parvus,	<i>Barnes.</i>		common.
plicatus,	<i>Lesueur.</i>		abundant.
pustulatus,	<i>Lea.</i>		very rare.
pustulosus,	<i>Lea.</i>		very abundant.
pyramidatus,	<i>Lea.</i>		common.
rectus,	<i>Lamarck.</i>		abundant.
rubiginosus,	<i>Lea.</i>		rare.
securis,	<i>Lea.</i>		common.
solidus,	<i>Lea.</i>		common.
spatulatus,	<i>Lea.</i>		rare.
tenuissimus,	<i>Lea.</i>		common.
triangularis,	<i>Barnes.</i>		rare.
trigonus,	<i>Lea.</i>		common.
tuberculatus,	<i>Barnes.</i>		common.
verrucosus,	<i>Barnes.</i>		common.
zigzag,	<i>Lea.</i>		common.
Margaritana complanata,	<i>Barnes.</i>		common.
confragosa,	<i>Lea.</i>		rather rare.
deltoidea,	<i>Lea.</i>		rare.

	<i>Hildrethiana</i> ,	<i>Lea.</i>	rare.
	<i>marginata</i> ,	<i>Say.</i>	common.
	<i>rugosa</i> ,	<i>Barnes.</i>	common.
<i>Anodonta</i>	<i>corpulenta</i> ,	<i>Cooper.</i>	common.
	<i>Ferussaciana</i> ,	<i>Lea.</i>	rare.
	<i>grandis</i> ,	<i>Say.</i>	common.
	<i>imbecillis</i> ,	<i>Say.</i>	common.
	<i>plana</i> ,	<i>Lea.</i>	rare.
	<i>undulata</i> ,	<i>Say.</i>	common.

CORBICULADÆ.—Some Species Common.

<i>Sphærium</i>	<i>occidentale</i> ,	<i>Prime.</i>
	<i>partumeium</i> ,	<i>Say.</i>
	<i>solidulum</i> ,	<i>Prime.</i>
	<i>stamineum</i> ,	<i>Conrad.</i>
	<i>striatinum</i> ,	<i>Lamarck.</i>
	<i>sulcatum</i> ,	<i>Lamarck.</i>
	<i>transversum</i> ,	<i>Say.</i>
	<i>rosaceum</i> ,	<i>Prime.</i>
<i>Pisidium</i>	<i>abditum</i> ,	<i>Haldeman.</i>
	<i>aequilaterale</i> ,	<i>Prime.</i>
	<i>Virginicum</i> ,	<i>Bourg.</i>

LIMNÆIDÆ.

<i>Limnæa</i>	<i>caperata</i> ,	<i>Say.</i>	common.
	<i>desidiosa</i> ,	<i>Say.</i>	common.
	<i>reflexa</i> ,	<i>Say.</i>	common.
<i>Physa</i>	<i>heterostropha</i> ,	<i>Say.</i>	abundant.
	<i>gyrina</i> ,	<i>Say.</i>	rare.
	<i>oleacea</i> ,	<i>Tryon.</i>	rare.
<i>Bulinus</i>	<i>hypnorum</i> ,	<i>Linn.</i>	common.
<i>Planorbella</i>	<i>armigera</i> ,	<i>Say.</i>	common.
<i>Planorbis</i>	<i>bicarinatus</i> ,	<i>Say.</i>	very rare.
	<i>glabratus</i> ,	<i>Say.</i>	extremely rare.
	<i>parvus</i> ,	<i>Say.</i>	common.
	<i>trivolvus</i> ,	<i>Say.</i>	abundant.
<i>Gyraulus</i>	<i>deflectus</i> ,	<i>Say.</i>	rare.
<i>Menteus</i>	<i>exacutus</i> ,	<i>Say.</i>	rare.
<i>Ancylus</i>	<i>rivularis</i> ,	<i>Say.</i>	rare.
	<i>fluviatilis</i> .	<i>Say.</i>	rare.

VALVATIDÆ.

<i>Valvata</i>	<i>tricarinata</i> ,	<i>Say.</i>	common.
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VIVIPARIDÆ.

<i>Vivipara</i>	<i>intertexta</i> ,	<i>Say.</i>	rather rare.
	<i>subpurpurea</i> ,	<i>Say.</i>	rare.
<i>Melantho</i>	<i>subsolidata</i> ,	<i>Anthony.</i>	very abundant.
<i>Lioplax</i>	<i>subcarinata</i> ,	<i>Say.</i>	common.

MELANIDÆ.		
Trypanostoma subulare,	<i>Lea.</i>	common.
Goniobasis livescens,	<i>Menke.</i>	rare.
AMNICOLIDÆ.		
Amnicola Cincinnatiensis,	<i>Anthony.</i>	rare.
Sayana,	<i>Anthony.</i>	rare.
orbiculata,	<i>Lea.</i>	rare.
pallida,	<i>Haldeman.</i>	rare.
parva,	<i>Lea.</i>	rare.
Pomatiopsis lapidaria,	<i>Say.</i>	very rare.
Somatogyrus isogonus,	<i>Say.</i>	common.
depressus,	<i>Tryon.</i>	rare.
AURICULIDÆ.		
Carychium exiguum,	<i>Say.</i>	rare.
HELICIDÆ.		
Hyalina arborea,	<i>Say.</i>	common.
chersina,	<i>Say.</i>	rare.
electrina,	<i>Gould.</i>	somewhat common.
indentata,	<i>Say.</i>	rare.
lineata,	<i>Say.</i>	common.
minuscula,	<i>Binney.</i>	common.
Helix alternata,	<i>Say.</i>	common.
clausa,	<i>Say.</i>	rare.
hirsuta,	<i>Say.</i>	rare.
labyrinthica	<i>Say.</i>	very rare.
monodon,	<i>Rackett.</i>	very rare.
multilineata,	<i>Say.</i>	abundant.
porcina,	<i>Say.</i>	very rare.
profunda,	<i>Say.</i>	common.
pulchella-var. costata,	<i>Muller.</i>	common.
thyroides,	<i>Say.</i>	rather common.
Macrocyclus concava,	<i>Say.</i>	common.
Pupa fallax,	<i>Say.</i>	very rare.
contracta,	<i>Say.</i>	rare.
Succinea Nuttalliana,	<i>Lea.</i>	common.
avara,	<i>Say.</i>	common.
obliqua,	<i>Say.</i>	scarce.
ovalis,	<i>Gould.</i>	common.

**Description of a Unio Shell Found on the South Bank of
the Mississippi River, Opposite the Rock Island
Arsenal, in 1870.**

BY W. H. PRATT.

PLATE XXXI, FIG. 1.

Shell sub-quadrangular, biangular posteriorly, inflated; a rather deep furrow extending obliquely from beak to basal margin; basal

margin emarginate; substance of shell heavy in the anterior portion; two or three very small nodules on the ridge before the furrow, but none near the basal margin; posterior slope covered with distinct but interrupted curved ridges crossing the lines of growth at right angles; beaks prominent, eroded; lunule large; lines of growth strongly marked, irregular; epidermis dark brown, rather shining; anterior cicatrices distinct, deep; posterior cicatrices confluent; dorsal cicatrices on the under side of the cardinal teeth, but rather toward the beak; cardinal teeth moderately large, erect, deeply cleft and sulcated in left valve, and in right valve scarcely double, rather flat, notched, and on the inner side rising direct from the cavity of the shell, direction almost at right angles with the lateral tooth; lateral teeth long, straight except at the extreme anterior end where they are somewhat curved toward the cardinal teeth, in right valve single, thin and sharp, in left valve double, sharp and compressed; cavity of shell deep; cavity of beaks deep and somewhat angulated; nacre white, iridescent in posterior margin.

Length.....5.59 mm.

Breadth.....6.86 "

Thickness.....4.06 "

Habitat, Mississippi River, vicinity of Davenport, Iowa.

REMARKS.—This, the only specimen known to us, was a dead shell, but very slightly weathered, and apparently rather recent.

It seems to most resemble *U. asperrimus*—*Lea*, which is common in the same locality, differing from that shell however, in many particulars.

In its general aspect it is much fuller, more rounded, and smoother.

It is a considerably heavier shell, much more inflated, rather more transverse, almost free from nodules, and entirely so on the posterior slope, of a richer, more reddish brown color, and more shining.

The cardinal teeth are smaller, and that in the right valve more flat and emerging more directly from the cavity.

The lateral teeth are thinner, and the double one more compressed. They are also more extended anteriorly, and at that end are decidedly curved toward the cardinal teeth, which they approach nearer than in *asperrimus*, while in the latter shell, they are not at all curved.

The lunule is about four times as large, being about the same size as in *U. verrucosus*—*Barnes*, but of different form.

It is apparently a matured shell, quite symmetrical, and exhibits no indications of abnormal growth or form.

Should this prove to be a new species it may be called *Unio unilatus*.

List of Coleoptera found in the Vicinity of Davenport, Iowa.

BY J. D. PUTNAM.

I have prepared the following list with the hope that it may lead some one to collect the beetles of this region more fully. About 225 species are herein enumerated and it is likely that double that number are to be found. For several years past I have been absent from the city during almost the whole of every collecting season, and in previous years I devoted but comparatively little time to collecting—otherwise the present list would have been much more extensive. This list is purely local, and no species is included which I have not found within easy walking distance of the city. I have considered a portion of Rock Island County, Illinois, as coming within these limits. Specimens of all the species are contained in my cabinet, and have been kindly named for me by Mr. Ulke. I have generally followed the arrangement given in Crotch's Check List.

List of Coleoptera.

CICINDELIDÆ

- | | |
|--|--|
| <i>Cicindela splendida</i> , <i>Hentz.</i> | <i>Cicindela repanda</i> , <i>Dej.</i> |
| <i>Cicindela 12-guttata</i> , <i>Dej.</i> | <i>Cicindela punctulata</i> , <i>Fabr.</i> |

CARABIDÆ.

- | | |
|--|--|
| <i>Elaphrus ruscarius</i> , <i>Say.</i> | <i>Dicælus sculptilis</i> , <i>Say.</i> |
| <i>Calosoma calidum</i> , <i>Fabr.</i> | <i>Anomoglossus emarginatus</i> , <i>Say.</i> |
| <i>Pasimachus elongatus</i> , <i>Lec.</i> | <i>Anomoglossus pusillus</i> , <i>Say.</i> |
| <i>Scarites subteraneus</i> , <i>Fabr.</i> | <i>Chlænienus laticollis</i> , <i>Say.</i> |
| <i>Brachynus americanus</i> , <i>Lec.</i> | <i>Chlænienus sericeus</i> , <i>Forst.</i> |
| <i>Galerita janus</i> , <i>Fabr.</i> | <i>Chlænienus prasinus</i> , <i>Dej.</i> |
| <i>Loxopeza grandis</i> <i>Hentz.</i> | <i>Chlænienus pensylvanicus</i> , <i>Say.</i> |
| <i>Calathus gregarius</i> , <i>Say.</i> | <i>Chlænienus impunctifrons</i> , <i>Say.</i> |
| <i>Platynus sinuatus</i> , <i>Dej.</i> | <i>Cratacanthus dubius</i> , <i>Beauv.</i> |
| <i>Platynus viridis</i> , <i>Lec.</i> | <i>Agonoderus lineola</i> , <i>Fabr.</i> |
| <i>Platynus decorus</i> , <i>Say.</i> | <i>Agonoderus pallipes</i> , <i>Fabr.</i> |
| <i>Platynus melanarius</i> , <i>Dej.</i> | <i>Anisodactylus discoideus</i> , <i>Dej.</i> |
| <i>Platynus æruginosus</i> , <i>Dej.</i> | <i>Anisodactylus baltimorensis</i> , <i>Say.</i> |
| <i>Evarthrus orbatus</i> , <i>Newm.</i> , var. <i>fat-</i> | <i>Anisodactylus sericeus</i> , <i>Harris.</i> |
| <i>uus</i> , <i>Lec.</i> | <i>Xestonotus lugubris</i> , <i>Dej.</i> |
| <i>Pterostichus stygius</i> , <i>Say.</i> | <i>Harpalus caliginosus</i> , <i>Fabr.</i> |
| <i>Pterostichus permundus</i> , <i>Say.</i> | <i>Harpalus faunus</i> , <i>Say.</i> |
| <i>Pterostichus chalcites</i> , <i>Say.</i> | <i>Harpalus compar</i> , <i>Lec.</i> |
| <i>Pterostichus lucublandus</i> , <i>Say.</i> | <i>Harpalus erythropus</i> , <i>Dej.</i> |
| <i>Pterostichus femoralis</i> , <i>Kirby.</i> | <i>Harpalus herbivagus</i> , <i>Say.</i> |
| <i>Amara avida</i> , <i>Say.</i> | <i>Stenolophus conjunctus</i> , <i>Say.</i> |
| <i>Amara fallax</i> , <i>Lec.</i> | <i>Stenolophus ochropezus</i> , <i>Say.</i> |
| <i>Amara confusa</i> , <i>Lec.</i> | <i>Patrobus longicornis</i> , <i>Say.</i> |
| <i>Dicælus splendidus</i> , <i>Say.</i> | <i>Tachys nanus</i> , <i>Gyll.</i> |
| <i>Dicælus purpuratus</i> , <i>Bon.</i> | |

HALIPLIDÆ.

Cnemidotus 12-punctatus, *Say*.

DYTISCIDÆ.

Hydroporus punctatus, <i>Say</i> .	Laccophilus maculosus, <i>Germ.</i>
Hydroporus venustus, <i>Lec.</i>	Matus bicarinatus, <i>Say</i> .
Hydroporus proximus, <i>Aube.</i>	Coptotomus interrogatus, <i>Fab.</i>
Hydrocanthus iricolor, <i>Say</i> .	

GYRINIDÆ.

Dineutus assimilis *Aube.* Gyrinus analis, *Say*.

HYDROPHILIDÆ.

Tropisternus lateralis, <i>Hb.</i>	Philhydrus nebulosus, <i>Say</i> .
Tropisternus glaber, <i>Hb.</i>	Philhydrus fimbriatus, <i>Mels.</i>
Laccobius agilis, <i>Rand.</i>	Hydrobius fuscipes, <i>Linn.</i>

STAPHYLINIDÆ.

Falagria venustula, <i>Er.</i>	Lathrobium longiusculum, <i>Grav.</i>
Creophilus villosus, <i>Grav.</i>	Cryptobium bicolor, <i>Grav.</i>
Staphylinus vulpinus <i>Nordm.</i>	Lathrimæum sordidum, <i>Er.</i>

SILPHIDÆ.

Silpha (Necrophorus) velutina, <i>Fab.</i>	Peltis marginalis, <i>Fab.</i>
<i>Oliv.</i>	Peltis inæqualis, <i>Fab.</i>
Silpha (Necrophorus) americana, <i>Lec.</i>	
Peltis surinamensis, <i>Fab.</i>	

SCAPHIDIIDÆ.

Scaphisoma convexum, *Say*.

DERMESTIDÆ.

Dermestes lardarius, <i>Linn.</i>	Attagenus megatoma, <i>Fab.</i>
Trogoderma ornata, <i>Say</i> .	

CUCUJIDÆ.

Læmophlæus biguttatus, *Say*.

COLYDIIDÆ.

Bothrideres geminatus, *Say*.

TROGOSITIDÆ.

Tenebrioides dubia, *Horn.* Tenebrioides nigrita, *Horn.*

NITIDULIDÆ.

Nitidula bipustulata, <i>Linn.</i>	Prometopia 6-maculata, <i>Say</i> .
Ips quadrisignatus, <i>Say</i> ,	

COCCINELLIDÆ.

Megilla maculata, <i>DeG.</i>	Anatis 15-punctata, <i>Oliv.</i>
Hippodamia convergens, <i>Guer.</i>	Psyllobora 20-maculata, <i>Say</i> .

- | | |
|--------------------------------------|-------------------------------------|
| Hippodamia 13-punctata, <i>Linn.</i> | Chilocorus bivulnerus, <i>Muls.</i> |
| Hippodamia parenthesis, <i>Say.</i> | Hyperaspis normata, <i>Say.</i> |
| Coccinella novem-notata, <i>Hb.</i> | Scymnus nanus, <i>Lec.</i> |
| Coccinella munda, <i>Say.</i> | |

HISTERIDÆ.

- | | |
|---------------------------------|-------------------------------|
| Hister americanus, <i>Payk.</i> | Hister Lecentei, <i>Mars.</i> |
|---------------------------------|-------------------------------|

LUCANIDÆ.

- Lucanus dama, *Thunb.*

SCARABÆIDÆ.

- | | |
|--------------------------------------|--------------------------------------|
| Copris anaglypticus, <i>Say.</i> | Phyllophaga fusca, <i>Frohl.</i> |
| Onthophagus latebrosus, <i>Fabr.</i> | Phyllophaga cognata, <i>Burm.</i> |
| Aphodius fimetarius, <i>Linn.</i> | Phyllophaga fraterna, <i>Harris.</i> |
| Aphodius granarius, <i>Linn.</i> | Phyllophaga marginalis, <i>Lec.</i> |
| Atenius stercorator, <i>Fab.</i> | Phyllophaga ilicis, <i>Knoch.</i> |
| Atenius abditus, <i>Hald.</i> | Phyllophaga tristis, <i>Fab.</i> |
| Bolboceras tumefactus, <i>Beaur.</i> | Strigoderma arboricola, <i>Fab.</i> |
| Bolboceras lazarus, <i>Fab.</i> | Pelidnotata punctata, <i>Linn.</i> |
| Geotrypes splendidus, <i>Fab.</i> | Cotalpa lanigera, <i>Linn.</i> |
| Geotrypes semiopacus, <i>Jek.</i> | Lygyrus morio, <i>Lec.</i> |
| Geotrypes opacus, <i>Hald.</i> | Xyloryctes satyrus, <i>Fab.</i> |
| Trox aequalis, <i>Say.</i> | Euryomia inda, <i>Linn.</i> |
| Serica vespertina, <i>Schon.</i> | Osmoderma eremicola, <i>Knoch.</i> |
| Diplotaxis, <i>n. sp.</i> | Valgus squamiger, <i>Beaur.</i> |
| Phyllophaga cephalica, <i>Lec.</i> | |

BUPRESTIDÆ.

- | | |
|--------------------------------------|-------------------------------|
| Chrysobothris femorata, <i>Lec.</i> | Agrilus defectus, <i>Lec.</i> |
| Chrysobothris 6-signata, <i>Say.</i> | |

ELATERIDÆ.

- | | |
|---------------------------------------|------------------------------------|
| Dromæolus cylindricollis, <i>Say.</i> | Melanotus communus, <i>Gyll.</i> |
| Alaus oculatus, <i>Linn.</i> | Melanotus tenax, <i>Say.</i> |
| Drasterius dorsalis, <i>Say.</i> | Melanotus opacicollis, <i>Lec.</i> |
| Menocrepidius auritus, <i>Hbst.</i> | Asaphes memnonius, <i>Hbst.</i> |

DASYLLIDÆ.

- Cyphon punctatus, *Lec.*

LAMPYRIDÆ.

- | | |
|------------------------------------|----------------------------|
| Calopteron typicum, <i>Newm.</i> | Lucidota atra, <i>Fab.</i> |
| Photurus pensylvanica, <i>DeG.</i> | |

TELEPHORIDÆ.

- | | |
|---|------------------------------------|
| Chaulignathus pensylvanicus, <i>DeGeer.</i> | Podabrus rugulosus, <i>Lec.</i> |
| Podabrus flavicollis, <i>Lec.</i> | Telephorus imbecillis, <i>Lec.</i> |
| | Telephorus flavipes, <i>Lec.</i> |

Podabrus tomentosus, Say.
Podabrus punctulatus, Lec.

Telephorus bilineatus, Say.

PTINIDÆ.

Ptinus brunneus, Dufsch.

Amphicerus bicaudatus, Say.

CERAMBYCIDÆ.

Orthosema cylindricus, Fab.

Neoclytus erythrocephalus, Fab.

Prionus imbricornis, Linn.

Strangalia famelica, Newm.

Prionus fissicornis, Hald.

Leptura nitens, Forst.

Eburia quadrigeminata, Say.

Paenocerus supernotatus, Say.

Elaphidion parallelum, Newm.

Goes debilis, Lec.

Elaphidion unicolor, Rand.

Sternidius variegatus, Hald.

Callimoxys sanguinicollis, Oliv.

Hyperplatys maculatus, Hald.

Cyllene charus, Say.

Saperda vestita, Say.

Cyllene flexuosus, Fab.

Tetraopes tornator, Fab.

Calloides nobilis, Say.

Tetraopes femoralis, Lec.

Xylotrechus colonus, Fab.

SPERMOPHAGIDÆ.

Mylabris (Bruchus) pisi, Linn.

CHRYSOMELIDÆ.

Coscinoptera dominicana, Fab.

Diabrotica vittata, Fab.

Fidia murina, Cr.

Oedionychis thoracica, Fab.

Heteraspis pubescens, Mels.

Oedionychis 6-maculata, Ill.

Chrysochus auratus, Fab.

Disonycha abbreviata, Nels.

Chrysomela decem-lineata, Say.

Graptodera chalybea, Ill.

Chrysomela scalaris, Lec.

Graptodera, n. sp.

Chrysomela casta.

Orchestris striolata, Ill.

Chrysomela Bigsbyana, Kirby.

Crepidodera opulenta, Lec.

Chrysomela interrupta, Fab.

Crepidodera pubescens, Ill.

Gastrophysa polygoni, Linn.

Psylliodes punctulata, Mels.

Phyllobrotica decorata, Say.

Coptocycla aurichalcea, Fab.

Diabrotica 12-punctata, Oliv.

TENEBRIONIDÆ.

Nyctobates pennsylvanica, DeG.

Blapstinus metallicus, Fab.

Merinus lævis, Oliv.

Platydema americanum, Lap.

Tenebrionellus molitor, Linn.

ANTHICIDÆ.

Corphyra pulchra, Lec.

Anthicus cervinus, Laf.

Notoxus monodon, Fabr.

MORDELLIDÆ.

Mordellistena æmula, Lec.

MELOIDÆ.

Macrobasis Fabricii, Lec.

Epicauta cinerea, Forst.

Epicauta convolvuli, *Mels.*
Epicauta lemniscata, *Fab.*

Epicauta pensylvanica, *DeG.*

CURCULIONIDÆ.

Ithycerus noveboracensis, *Forst.* *Sphenophorus melanocephalus*, *Fab.*
Dorytomus mucidus, *Say.* *Sphenophorus parvulus*, *Gyll.*
Magdalis perforatus, *Dej.* Also several unnamed species.
Balaninus, no name.

SCOLYTIDÆ.

Xyloterus vicinus, *Zimm.*

Coleoptera collected at Monticello, Iowa, June 12th, 1872.

<i>Galereta janus</i> , <i>Fab.</i>	<i>Agrilus defectus</i> , <i>Lec.</i>
<i>Platynus extensicollis</i> , <i>Say</i> , variety	<i>Photinus lacustris</i> , <i>Lec.</i>
<i>viridis</i> , <i>Lec.</i>	<i>Clerus thoracicus</i> , <i>Oliv.</i>
<i>Amara avida</i> , <i>Say.</i>	<i>Bruchus near seminatum</i> , <i>Horn.</i>
<i>Amara angustata</i> , <i>Say.</i>	<i>Donacia emarginata</i> , <i>Kirby</i>
<i>Amara impuncticollis</i> , <i>Say.</i>	<i>Babia pulla</i> , <i>Lec.</i>
<i>Chlœnius sericeus</i> , <i>Forst.</i>	<i>Pachybrachys carbonarius</i> , <i>Hald.</i>
<i>Anisodactylus Baltimorensis</i> , <i>Dej.</i>	<i>Pachybrachys infatustus</i> , <i>Hald.</i>
<i>Harpalus pedicularius</i> , <i>Dej.</i>	<i>Pachybrachys tridens</i> , <i>Mels.</i>
<i>Harpalus erythropus</i> , <i>Dej.</i>	<i>Doryphora decemlineata</i> , <i>Say.</i>
<i>Stenolophus fuliginosus</i> , <i>Dej.</i>	<i>Longitarsus</i> , <i>sp.?</i>
<i>Stenus</i> , <i>n. sp.</i>	<i>Phylotreta striolata</i> , <i>Ill.</i>
<i>Corticaria pumilla</i> , <i>Mels.</i>	<i>Crepidodera opulenta</i> , <i>Lec.</i>
<i>Ips quadrisignatus</i> , <i>Say.</i>	<i>Blapstinus metallicus</i> , <i>Fab.</i>
<i>Coccinella munda</i> , <i>Say.</i>	<i>Corphyra lugubrus</i> , <i>Say.</i>
<i>Hister abbreviatus</i> , <i>Fabr.</i>	<i>Notoxus anchora</i> , <i>Hentz.</i>
<i>Hister americanus</i> , <i>Payk.</i>	<i>Eustrophus bicolor</i> , <i>Say.</i>
<i>Phellister subrotundus</i> , <i>Br.</i>	<i>Eugnaptus angustatus</i> .
<i>Saprinus fraternus</i> , <i>Say.</i>	<i>Baradius confusus</i> , <i>Lec.</i>

Coleoptera collected near Frederic, Monroe Co., Iowa, August, 1869.

<i>Harpalus caliginosus</i> , <i>Say.</i>	<i>Clytus charus</i> , <i>Say.</i>
<i>Hippodamia maculata</i> , <i>DeGeer.</i>	<i>Clytus flexuosus</i> , <i>Fabr.</i>
<i>Hippodamia 13-punctata</i> , <i>Linn.</i>	<i>Tetraopes femoralis</i> , <i>Lec.</i>
<i>Canthon lævis</i> , <i>Drury.</i>	<i>Chrysochus auratus</i> , <i>Fab.</i>
<i>Calapteron terminalis</i> , <i>Say.</i>	<i>Colaspis livens</i> , <i>Dej.</i>
<i>Calopteron typicum</i> , <i>Newman.</i>	<i>Diabrotica 12-punctata</i> , <i>Fab.</i>
<i>Chauliognathus pensylvanicus</i> ,	<i>Epicauta convolvuli</i> , <i>Mels.</i>
<i>DeGeer.</i>	<i>Epicauta lemniscata</i> , <i>Fabr.</i>
<i>Prionus imbricornis</i> , <i>Linn.</i> , variety.	<i>Epicauta cinerea</i> , <i>Forst.</i>
<i>Eburia quadrigeminata</i> , <i>Say.</i>	<i>Epicauta pensylvanica</i> , <i>DeGeer.</i>

**List of Lepidoptera collected in the vicinity of Davenport,
Iowa.**

BY J. DUNCAN PUTNAM.

The following list embraces all the butterflies and most of the larger moths which I have collected within short walking distance of Davenport. It is necessarily incomplete as I have been absent during the best seasons and of late years no one else has made any collection, so that it is probable that a considerable number of species remain to be added. Specimens of all but two or three of the species mentioned are contained in my cabinet. For the determination of some of the doubtful species I am indebted to Mr. H. Strecker. In preparing this list I have, with a few exceptions followed the synopsis of W. H. Edwards.

RHOPALOCERA.

Papilio philenor, Linn.

One male taken in 1874.

Papilio asterius, Cramer.

The most abundant species of *Papilio* found here.

Papilio troilus, Linn.

Two males taken in 1874.

Papilio turnus, Linn.

Quite plentiful most seasons. Both the yellow and black (*P. glaucus*, Linn) forms of the female are found—the black being most common.

Papilio cressphontes, Cramer.

My specimen is from Aledo, Ill., 30 miles south of Davenport, but I have seen several specimens taken near the city. It is rare.

Papilio ajax, Linn.

One specimen was taken in the grounds of Griswold College, some years ago.

Pieris protodice, Boisd & Lec.

Very abundant.

Nathalis Iole, Boisd.

One specimen October 23d, 1872.

Colias casonia, Stoll.

Not very plentiful.

Colias erytheme, Boisd.

Quite common some seasons.

Colias philodice, Godt.

Very abundant all seasons. The white variety of the female is rarely seen.

Terias lisa, Boisd.

I have but one imperfect specimen which I am confident belongs to this species.

Danaus erippus, Cram. (*D. archippus*, Fabr.)

Usually very abundant, sometimes occurring in immense swarms.

Argynnis cybele, Fabr.

Our most abundant species of *Argynnis*.

Argynnis aphrodite, Fabr.

Not so common as *A. cybele*.

Argynnis myrina, Cramer.

One specimen taken in May, 1871.

Phyciodes tharos, Drury.

Quite plentiful on Rock Island and also about Davenport.

Grapta interrogationis, Fab. variety *umbrosa*, Lint.

Common.

Grapta progne, Cram.

Not quite so plentiful as the above.

Vanessa antiopa, Linn.

Frequently very abundant in the fall.

Pyrameis cardui, Linn.

Plentiful.

Pyrameis atalanta, Linn.

Rather rare.

Limnitis ureula, Fab.

Abundant in the early summer.

Limnitis misippus, Fab.

Common later in the season.

Euptychia eurytus, Fab.

Common in the spring in the woods.

Satyrus alope, Fab.

Not usually very common.

Satyrus nephele, Kirby.

Rather rare.

Letho portlandia, Fabr.

Quite abundant in the woods during the summer.

Chrysophanus Thoe, Gray.

Only one imperfect specimen.

Lycæna comyntas, Godt.

Tolerably common.

Goniloba tityrus, Fabs.

Usually quite common.

Eudamus Pylades, Scud.

One specimen, June 1871.

Nisoniades juvenalis, Fabr.

Not very common.

Nisoniades persius, Scud.

One specimen.

Pyrgus tessellata, Scud.

Not uncommon in October.

Hesperia vialis, Edw.

Only one specimen.

Pamphila Leonardus Harris.

Only one specimen June 1871.

Pamphila hobomik, Harris.

Generally plentiful.

Pamphila Peckius, Kirby.

But one specimen in bad order.

HETEROCERA.

Macroglossa diffinis, Boisd.

Tolerably common.

Darapsa myron, Cramer.

Moderately abundant, the larvæ being quite destructive to the grape vines.

Chærocampa tersa, Linn.

Only two specimens have been taken, one of them August 23d 1872.

Deilephila lineata, Fabr.

Usually very abundant about flower gardens.

Philampelus pandorus, Hübner. (*P. satellitia* Harris.)

Tolerably common.

Philampelus achemon, Drury.

Tolerably common.

Smerinthus geminatus, Say.

One specimen taken in July.

Smerinthus excæcatus, Sm. & Ab.

Rather common.

Macrosila quinquemaculata, Haw.

Very plentiful.

Ceratomsa amyntor, Hübner. (*C. quadricornis*, Harris.)

Two specimens.

Scepsis fulvicollis, Hübner.

Two specimens taken in September.

Crocata quinquaria, Grote.

Crocata brevicornis, Walker.

Several varieties of this species are quite common.

Callimorpha LeContei, Boisd. (*C. Militaris*, Harris.)

Not uncommon.

Arctia nais, Hübner. (*A. Phalerata*, Harris.)

Common.

Arctia figurata, Drury.

One specimen.

Arctia arge, Drury.

One specimen.

Pyrrhartia isabella, Smith.

One specimen.

Leucarcia acraea, Pack.

One specimen.

Spilosoma virginica, Fabr.

Quite common.

Orgia leucostigma, Smith.

Not very common.

Nadata gibbosa, Smith & Abb.

Two specimens May and July.

Nerice bidentata, Walk.

One specimen, July.

Telea polyphemus, Linn.

Two specimens.

Tropaea luna, Linn.

Two specimens.

Samia cecropia, Linn.

Quite plentiful.

Hemileuca maia, Drury.

One female was found floating in a small pool of water in the fall of 1871.

Gastropacha americana, Harr.

Two specimens.

Xeleutes robinia, Peck.

Several females and one male have been collected

Thysania zenobia, Cram.

A single specimen of this magnificent moth was captured by Prof. D. S. Sheldon, a number of years ago on the roof of Griswold College, in this city.

Eudryus grata, Fabr.

One specimen taken in June 1871.

List of Coleoptera collected in the Rocky Mountains of Colorado, in 1872.

BY J. D. PUTNAM.

During the summer of 1872, I had the pleasure of accompanying our worthy President, Dr. C. C. Parry, on one of his delightful botanical excursions to the Rocky Mountains. Locating ourselves in a deserted cabin, far up toward the sources of Clear Creek, in a beautiful park west of Empire City, we made numerous ascents to the alpine summits of the surrounding mountains. Although I had had no previous experience in collecting, yet by the vigorous use of the sweep-net, careful turning over of stones, etc., comparatively large collections were made. A trip through Middle Park on foot in September added a number of species. A small collection made on the plains

along the base of the mountains at Boulder, Denver and Canon City, in the fall of 1874 and spring of 1875 is also included. The species were all kindly named for me by Mr. Ulke of Washington. There are 250 species here enumerated, of which a few are unnamed. I hope sometime to be able to complete lists of some of the other orders of insects of which large collections were made.

List of Coleoptera.

CICINDELIDÆ.

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|---|------------------------------------|
| <i>Cicindela longilabrus</i> , Say. | <i>Cicindela fulgida</i> , Say. |
| <i>Cicindela scutellaria</i> , Say. | <i>Cicindela 12-guttata</i> , Dej. |
| <i>Cicindela purpurea</i> , Olio. black and <i>Cicindela punctulata</i> , Fabr. | |
| green varieties of <i>Andubonii</i> , Lec. | |

CARABIDÆ.

- | | |
|--|--------------------------------------|
| <i>Trachypachys inermis</i> , Mots. | <i>Amara obesa</i> , Say. |
| <i>Calosoma tepidum</i> , Lec. variety of | <i>Amara terrestris</i> , Lec. |
| <i>C. calidum</i> , Fabr. | <i>Nothopus zabroides</i> , Lec. |
| <i>Carabus agassizii</i> , Lec. variety of | <i>Cratacanthus dubius</i> , Beauv. |
| <i>tædatus</i> , Fabr. | <i>Piosoma setosum</i> , Lec. |
| <i>Brachynus conformis</i> , Dej. | <i>Agonoderus lineola</i> , Fabr. |
| <i>Loxopeza atriceps</i> , Lec. | <i>Agonoderus pallipes</i> , Fabr. |
| <i>Lebia viridis</i> , Say. | <i>Selenophorus areus</i> , Lec. |
| <i>Metabletus americanus</i> , Dej. | <i>Harpalus amputatus</i> , Say. |
| <i>Cymindis abstrusa</i> , Lec. | <i>Harpalus pleuriticus</i> , Kirby. |
| <i>Cymindis cribricollis</i> , Dej. | <i>Harpalus ellipsis</i> , Lec. |
| <i>Calathus ingratus</i> , Dej. | <i>Harpalus fraternus</i> , Lec. |
| <i>Pterostichus protractus</i> , Lec. | <i>Harpalus basilaris</i> , Kirby. |
| <i>Pterostichus agrestis</i> , Bland. | <i>Harpalus varicornis</i> , Lec. |
| <i>Pterostichus Luczotii</i> , Dej. | <i>Bembidium nitidulum</i> , Dej. |
| <i>Pterostichus longulus</i> , Lec. | <i>Bembidium bifossulatum</i> , Lec. |
| <i>Amara latior</i> , Kirby. | <i>Bembidium nebraskense</i> , Lec. |
| <i>Amara impuncticollis</i> , Say. | <i>Bembidium rapidus</i> , Lec. |
| <i>Amara fallax</i> , Lec. | |

DYTISCIDÆ.

- | | |
|---------------------------------------|-----------------------------------|
| <i>Hydroporus nubilus</i> , Lec. | <i>Agabus morosus</i> , Lec. |
| <i>Hydroporus catescopium</i> , Say. | <i>Agabus seriatus</i> , Say. |
| <i>Laccophilus maculosus</i> , Germ. | <i>Agabus fimbriatus</i> , Lec. |
| <i>Laccophilus truncatus</i> , Mann. | <i>Agabus</i> , no name. |
| <i>Dystiscus marginicollis</i> , Lec. | <i>Agabus tæniolatus</i> , Harr. |
| <i>Acllius semisulcatus</i> , Aube. | <i>Agabus griseipennis</i> , Lec. |
| <i>Colymbetes densus</i> , Lec. | |

HYDROPHILIDÆ.

- | | |
|------------------------------------|------------------------------------|
| <i>Helophorus lacustris</i> , Lec. | <i>Hydrobius fuscipes</i> , Leach. |
| <i>Berosus striatus</i> , Say. | |

STAPHYLINIDÆ.

- | | |
|--|---|
| <i>Quedius fulgidus</i> , <i>Fabr.</i> | <i>Platystethus americanus</i> , <i>Er.</i> |
| <i>Creophilus villosus</i> , <i>Kirby.</i> | <i>Omalius</i> , <i>n. sp.</i> |
| <i>Philonthus æneus</i> , <i>Rossi.</i> | |

SILPHIDÆ.

- | | |
|--|--|
| <i>Necrophorus hecate</i> , <i>Bland.</i> | <i>Peltis</i> (<i>Silpha</i>), <i>lapponica</i> , <i>Herbst.</i> |
| <i>Necrophorus melsheimeri</i> , <i>Kirby.</i> | |

LATRIDIIDÆ.

- Latridius kirbyi*, *Lec.*

DERMESTIDÆ.

- | | |
|---|--|
| <i>Dermestes marmoratus</i> , <i>Say.</i> | <i>Dermestes nubilus</i> , <i>Say.</i> |
| <i>Dermestes mannerheimii</i> , <i>Lec.</i> | <i>Dermestes talpinus</i> , <i>Mann.</i> |
| <i>Dermestes fasciatus</i> , <i>Lec.</i> | <i>Anthrenus lepidus</i> , <i>Lec.</i> |

EROTYLEIDÆ.

- Languria læta*, *Lec.*

ATOMARIIDÆ.

- | | |
|---|--|
| <i>Antherophagus ochraceus</i> , <i>Mels.</i> | <i>Atomaria</i> , two unnamed species. |
| <i>Cryptophagus cellaris</i> , <i>Scop.?</i> | |

TROGOSITIDÆ.

- Nosodes silphides*, *Lec.*

NITIDULIDÆ.

- | | |
|--|--|
| <i>Tribrachys caudalis</i> , <i>Lec.</i> | <i>Omosita inversa</i> , <i>Lec.</i> |
| <i>Carpophilus discoideus</i> , <i>Lec.</i> | <i>Meligethes ruficornis</i> , <i>Lec.</i> |
| <i>Carpophilus pallipennis</i> , <i>Say.</i> | <i>Meligethes rufimanus</i> , <i>Lec.</i> |
| <i>Nitidula ziczac</i> , <i>Say.</i> | <i>Pityophagus vittatus</i> , <i>Say.</i> |
| <i>Nitidula uniguttata</i> , <i>Mels.</i> | |

PHALACRIDÆ.

- Phalacrus penicillatus*, *Say.*

COCCINELLIDÆ.

- | | |
|--|--|
| <i>Hippodamia 5-signata</i> , <i>Kirby.</i> | <i>Coccinella 9-notata</i> , <i>Hb.</i> |
| <i>Hippodamia Lecontei</i> , <i>Muls.</i> | <i>Coccinella monticola</i> , <i>Muls.</i> |
| <i>Hippodamia spuria</i> , <i>Lec.</i> | <i>Coccinella transversoguttata</i> , <i>Fabr.</i> |
| <i>Hippodamia parenthesis</i> , <i>Say.</i> | <i>Brachyacantha albifrons</i> , <i>Say.</i> |
| <i>Anisosticta episcopalis</i> , <i>Kirby.</i> | <i>Scymnus puncticollis</i> , <i>Lec.</i> |
| <i>Coccinella trifasciata</i> , <i>Linn.</i> | |

CISTELIDÆ.

- Cistella cyclophorus*, *Kirby.*

HISTERIDÆ.

- | | |
|--|---|
| <i>Hister abbreviatus</i> , <i>Fab.</i> | <i>Saprinus pratensis</i> , <i>Lec.</i> |
| <i>Saprinus pensylvanicus</i> , <i>Payk.</i> | |

SCARABÆIDÆ.

<i>Phanæus carnifex</i> , Linn.	<i>Ligyris morio</i> , Lec.
<i>Trox morsus</i> Lec.	<i>Euryomia inda</i> , Linn.
<i>Trox punctatus</i> , Germ.	<i>Trichius affinis</i> , Gory.

BUPRESTIDÆ.

<i>Buprestis maculiventris</i> , Say. var.	<i>Anthaxia retifer</i> , Lec.
<i>Melanophila longipes</i> , Say.	<i>Agrilus politus</i> , Say.
<i>Melanophila Drummondi</i> , Kirby.	<i>Agrilus</i> , no name, Denver.

ELATERIDÆ.

<i>Lacon rectangularis</i> , Say.	<i>Drasterius elegans</i> , Fabr.
<i>Cardiophorus fenestratus</i> , Lec.	

DASYLLIDÆ.

Cyphon fuscipes, Kirby.

LAMPYRIDÆ.

<i>Photinus</i> , n. sp.	<i>Microphotus angustus</i> , Lec.
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TELEPHORIDÆ.

<i>Chauliognathus basalis</i> , Lec.	<i>Podabus</i> — ? near <i>puberulus</i> , Say.
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MALACHIDÆ.

<i>Collops punctatus</i> , Lec.	<i>Dasytes breviusculus</i> , Motsch.
<i>Collops cribrus</i> , Lec.	<i>Dasytes hudsonicus</i> , Lec.
<i>Attalus morulus</i> , Lec.	<i>Dasytes senilis</i> , Lec.

CLERIDÆ.

<i>Trichodes ornatus</i> , Say.	<i>Clerus sphegeus</i> , Fabr.
Very abundant on the flowers of <i>Clerus moestus</i> , Klug.	
<i>Potentilla flava</i> in the mountains. <i>Hydnocera subfasciata</i> , Lec.	
<i>Clerus analis</i> , Lec. variety.	<i>Hydnocera cyanescens</i> , Lec.
In the flowers of Prickly pear. <i>Hydnocera pubescens</i> , Lec.	
<i>Clerus nigriiventris</i> , Lec.	<i>Corynetes violaceus</i> , Linn.

CERAMBYCIDÆ.

<i>Ergates spiculates</i> , Lec.	<i>Typhocerus</i> , n. sp.
<i>Asemum moestum</i> , Hald.	<i>Leptura rufbasis</i> , Lec.
<i>Asemum atrum</i> , Esch.	<i>Leptura sexmaculata</i> , Linn.
<i>Criocephalus obsoletus</i> , Rand.	<i>Leptura cribripennis</i> , Lec.
<i>Phymatodes dimidiatus</i> , Kirby.	<i>Leptura sanguinea</i> , Lec.
<i>Crossidius pulchellus</i> , Lec.	<i>Leptura auripilis</i> , Lec.
<i>Crossidius discoideus</i> , Say.	<i>Monohammus clamator</i> , Lec.
<i>Clytus undulatus</i> , Say.	<i>Aedilis obliquus</i> , Lec.
<i>Clytus lunatus</i> , Kirby.	<i>Dectes spinosus</i> , Say.
<i>Clytus lezcouonius</i> , Lap.	<i>Pogonocherus mixtus</i> , Hald.
<i>Pachyta liturata</i> , Kirby.	<i>Stenostota pergrata</i> , Say.
<i>Acmaeops strigilata</i> , Fab.	<i>Tetraopes annulatus</i> , Lec.

SPERMOPHAGIDÆ.

Mylabris (*Bruchus*) *discoideus*, *Say*. *Mylabris* (*Bruchus*) *fraterculus*, *Horn*.

CHRYSOMELIDÆ.

<i>Donacia cuprea</i> , <i>Kirby</i> .	<i>Luperus longulus</i> , <i>Lec</i> .
<i>Orsodachna childreni</i> , <i>Kirby</i> .	<i>Galerucella notulata</i> , <i>Fabr</i> . var.
<i>Lema trilineata</i> , <i>Oliv</i> .	<i>bilineata</i> , <i>Kirby</i> .
<i>Coscinoptera subfasciata</i> , <i>Lec</i> .	<i>Monoxia guttulata</i> , <i>Lec</i> .
<i>Coscinoptera vittigera</i> , <i>Lec</i> .	<i>Monoxia debilis</i> , <i>Lec</i> .
<i>Pachybrachys viduatus</i> , <i>Fabr</i> . var.	<i>Trirhabda convergens</i> , <i>Lec</i> .
<i>Pachybrachys atomarius</i> , <i>Mels</i> .	<i>Disonychia triangularis</i> , <i>Say</i> .
<i>Adoxus vitis</i> , <i>Linn</i> .	<i>Graptodera inærata</i> , <i>Lec</i> .
<i>Chrysochus auratus</i> , <i>Fabr</i> .	<i>Graptodera torquata</i> , <i>Lec</i> .
<i>Colaspis puncticollis</i> , <i>Say</i> .	<i>Graptodera foliaceæ</i> , <i>Lec</i> .
<i>Chrysomela adonidis</i> , <i>Fabr</i> .	<i>Longitarsus n. sp.</i> Denver.
<i>Luperus meraca</i> , <i>Say</i> .	<i>Orchestris lewesii</i> , <i>Cr</i> .
<i>Chrysomela decemlineata</i> , <i>Say</i> .	<i>Systena elongata</i> , <i>Fabr</i> .
<i>Chrysomela exclamationis</i> , <i>Fabr</i> .	<i>Crepidodera opulenta</i> , <i>Lec</i> .
<i>Chrysomela conjuncta</i> , <i>Rog</i> .	<i>Phylotreta</i> , <i>n. sp.</i>
<i>Chrysomela bigsbyana</i> , <i>Kirby</i> .	<i>Psylliodes</i> , two species.
<i>Chrysomela scripta</i> , <i>Fabr</i> .	<i>Chelymorpha cribraria</i> , <i>Fabr</i> .
<i>Chrysomela interrupta</i> , <i>Fabr</i> .	<i>Cassida sex punctata</i> , <i>Fabr</i> .

TENEBRIONIDÆ.

<i>Trimytis pruinosa</i> , <i>Lec</i> .	<i>Eleodes obsoleta</i> , <i>Say</i> .
<i>Asida opaca</i> , <i>Say</i> .	<i>Eleodes extricata</i> , <i>Say</i> .
<i>Asida polita</i> , <i>Say</i> .	<i>Eleodes nigrina</i> , <i>Lec</i> .
<i>Asida sordida</i> , <i>Lec</i> .	<i>Eleodes pimelioides</i> , <i>Mann</i> .
<i>Asida convexicollis</i> , <i>Lec</i> .	<i>Tenebrionellis obscurus</i> , <i>Fabr</i> .
<i>Asida elata</i> , <i>Lec</i> .	<i>Blapstinus pratensis</i> , <i>Lec</i> .
<i>Eusattus reticulatus</i> , <i>Say</i> .	<i>Hypophloeus parallelus</i> , <i>Mels</i> .

ANTHICIDÆ.

<i>Corphyra pulchra</i> , <i>Lec</i> .	<i>Notoxus serratus</i> , <i>Lec</i> .
<i>Corphyra Lewisii</i> , <i>Horn</i> .	<i>Anthicus nitidulus</i> , <i>Lec</i> .
<i>Notoxus anchora</i> , <i>Hentz</i> .	

MORDELLIDÆ.

<i>Pentaria trifasciata</i> , <i>Mels</i> .	<i>Mordellistena divisa</i> , <i>Lec</i> .
<i>Anaspis nigra</i> , <i>Hald</i> .	<i>Mordellistena angusta</i> , <i>Lec</i> .
<i>Anaspis rufa</i> , <i>Say</i> .	<i>Mordellistena æmula</i> , <i>Lec</i> .
<i>Mordella scutellaris</i> , <i>Fabr</i> .	

MELOIDÆ.

<i>Meloe afer</i> , <i>Blard</i> .	<i>Lytta sphaericollis</i> , <i>Say</i> .
<i>Epicauta sericans</i> , <i>Sec</i> .	on <i>Symphorocarpus</i> .
<i>Epicauta pruinosa</i> , <i>Lec</i> .	<i>Nemognatha lurida</i> , <i>Lec</i> .
<i>Epicauta maculata</i> , <i>Say</i> . var. con-	<i>Gnathium minimum</i> , <i>Say</i>
<i>spersa</i> , <i>Lec</i> .	

OEDEMERIDÆ.

Calopus angustus, Lec.

PYTHIDÆ.

Crymodes discicollis, Lec.

CURCULIONIDÆ.

Epicaerus? ———?*Notiodes limatulus*, Gyll.*Ophryastes decipiens*, Lec.*Apion* ———? Denver.*Ophryastes latirostris*, Lec.*Rhynchites bicolor*, Fabr.*Ophryastes vittatus*, Say.*Rhynchites* ———?*Listroderes* ———?*Copturus operculatus*, Say.*Cleonus trivittatus*, Say.*Centorhyncus*. Four species.*Erirrhinus*. Four species.*Cossonus platea*, Say.*Dorytomus mucidus*, Say.

SCOLYTIDÆ.

Xyloterus bivittatus, Kirby.*Hylastes gracilis*, Lec.*Tomicus pini*, Say.*Dendrocinus terebrans*, Lec.

List of Lepidoptera collected in Colorado during the summer of 1872.

BY J. DUNCAN PUTNAM.

RHOPALOCERA.

Papilio zolicaon, Boisd.

One specimen was taken on the summit of Douglass Mountain (9,500 ft Alt.), near Empire City, July 19th, and another on the road six miles west of Empire. It was seen at other times—frequently on the bare summits of the lower mountains. Both specimens are males, and are well represented by the figures in Edward's Butterflies of North America, while a pair (♂♀) which I obtained in the Owl Creek Mts., Wyoming, in 1873, both are considerably larger and are better represented by the figure in Strecker's Lepidoptera, plate 6, fig. 3. This species, which bears considerable resemblance to *P. machaon*, seems to be the most abundant of the species of *Papilio* peculiarly characteristic of the Rocky Mountains. I have met it wherever I have been in Colorado, Wyoming and Utah.

Papilio indra, Reakirt.

Two females of this rare species were taken in Clear Creek Canon, from five to twelve miles above Golden City, on the morning of July 1st. No other specimens were noticed during the summer.

Papilio rutulus, Boisd.(?)

One specimen of this or an allied species was taken on Clear Creek west of Empire City, August 8th.

Papilio eurymedon, Boisd.

One specimen was taken in Clear Creek Canon, on July 1st.
Same locality with *P. indra*.

Parnassius smintheus, Doubleday.

Very abundant in the valleys during July, and high up on the mountains in August. Generally those on the mountain are smaller, but this is not always the case. The males were much more abundant than the females. I collected twenty-two of the former and but five of the latter. They were mostly of the ordinary varieties like the figures on Edward's Plate I. of *Parnassius*, scarcely ever two alike. But one well marked specimen of the variety *Behrii* ♂ was obtained high up on Pyramid Peak near Empire, above timber line, August 1st. It is considerably larger than Edward's figure and somewhat more heavily marked.

Pieris oleracea, Boisd.

Quite common at Empire City during July, and is found high up on the neighboring peaks during August. Most all of the specimens have the veins on the under side, heavily bordered with grayish and the upper surface has a decided yellow tinge: It does seem to me that this must be a different species from *oleracea* which I have collected in New York and Utah. In the Wasatch Mts. *oleracea* is abundant and almost entirely immaculate. The Colorado specimens seem to approach very near *P. hulda* Edw., but that is only known from Kodiak, Alaska. One or two specimens collected above the timber line in Colorado are without the margins to the veins, but other specimens from the same locality are the most heavily marked of any.

Pieris protodice, Boisd & Lec.

Not uncommon at Empire and on the surrounding mountains.
Also taken on the plains at Valmont

Pieris occidentalis, Reakirt.

Common at Empire City and in Middle Park.

Anthocaris ausonoides, Boisd.

Abundant at Empire City during July. Two specimens were taken at the timber line (11,500 ft) on Mount Flora, Sept. 8. All the specimens from Colorado are much smaller than those I have seen from California.

Anthocaris Julia, W. H. Edwards.

One specimen, a female, Empire City, July 20th.

Colias eurytheme, Boisd.

One female was taken at Empire City, July 29th.

Colias Alexandra, Edw.

Quite common at Empire City during July.

Colias Scudderii, Reakirt.

One specimen undoubtedly of this species was taken July 1st, in Clear Creek Canon, below the Junction.

Colias Meadii, Edw.

Found sparingly during August and September, on the peaks about Empire City—always above timber-line.

Euptoieta claudia, Cramer.

One specimen, Clear Creek Canon, July 1st.

Argynnis nevadensis, W. H. Edwards.

One specimen from above timber-line on Bald Mountain, near Empire, July 15th.

Argynnis near *enrynome*, Edw.

Quite plentiful on Mount Flora, near the timber-line, September 3d; also one specimen from Berthoud's Pass, September 18th, and another from Middle Park, Sept. 14.

Argynnis hesperis, Edw.

Not uncommon along the road west of Empire City to Berthoud's Pass, September 13. One specimen of the same species was taken in the same locality, August 6th.

Argynnis Helena, W. H. Edwards.

Common near the timber line on the mountains about Empire during August and September, and occasionally at lower altitudes.

Melitæa nubigena, Behr.

One specimen probably of this species was caught above timber line on Bald Mountain, July 19th.

Melitæa —sp?

One specimen from above timber-line east of Berthouds Pass, August 6th.

Melitæa —sp?

One specimen from the summit of Parry's Peak (13000 feet), July 25th. This species appears to be quite common in company with *M. nubigena* on the higher and more barren peaks, but owing to the nature of the ground they are difficult to capture.

Melitæa Palla, Boisd.

Four poorly preserved specimens from Clear Creek Canon, July 1st.

Melitæa arachne, Edw.

One specimen from Clear Creek Canon, July 1st.

Phyciodes picta, W. H. Edwards.

Common at Empire City in July, and higher up Clear Creek in August.

Phyciodes —sp?

One specimen taken in Clear Creek Canon, July 1st.

Grapta zephyrus, Edw.

Clear Creek, Canon, July 1st. Empire City, August.

Vanessa antiopa, Linn.

Not uncommon at Empire City in August and September. One specimen taken near Troublesome River, Middle Park, September 15th.

Vanessa milbertii, Godart.

Plentiful about Empire City in July, and not uncommon on the mountains in the latter part of August and September. Fresh specimens were again noticed in the valleys in September.

Pyrameis cardui, Linn.

Common about Denver in June and about Empire City in July. One unusually large specimen was taken on the very summit of a high peak east of Berthoud's Pass, over 12,500 feet above the sea, on August 6th.

Limenitis weidemeyerii, Edw.

One specimen taken in Clear Creek Canon, July 1st, and another at Empire City, July 18th. It does not appear to be uncommon.

Cosmonympha ochracea, Edw.

Very common at Empire City during July.

Satyrus charon, Edw.

Quite plentiful at Empire City during the whole season.

Satyrus ridingsii, Edw.

Common at Denver in June.

Erebia tyndarus, Esp. (*E. Callais*, Edw.)

One specimen high up above timber-line, on Pyramid Peak, August 1st.

Chionobas chryxus, Hewitson.

Not uncommon on the mountains about Empire City during July and August.

Chrysophanus helloides, Boisd.

Abundant high up on the mountains from 9,000 feet to above timber-line.

Lycæna antægon, Boisd.

Not uncommon near the timber-line, in August.

Lycæna melissa, Edw.

Taken at Denver in June and at Empire in July.

Lycæna orbitulus, DePrunner. (*L. rustica*, Edw.)

Plentiful at Empire City and on the surrounding mountains.

Lycæna lycea, Edw.

Taken at the timber-line on Mad Creek in July and August.

Lycæna ——— sp?

Several specimens taken near the timber-line on Mount Flora, July 17th.

Nisoniades tristis, Boisd.

One specimen from Clear Creek Canon, July 1st.

Nisoniades ennius, Scud. (Variety of *N. juvenalis*, Fabr.)

One specimen taken at Empire City, July 16th, and another on the top of Douglas Mountain July 23d.

Pamphila metacomet, Harris.

One specimen from Clear Creek Canon, July 1st.

Pamphila ——— sp?

One specimen from near the timber-line on Mount Flora, September 8d.

Pamphila ——— sp?

Two specimens from Clear Creek Canon, July 1st.

HETEROCERA.

Delilephila lineata, Fabr.

One specimen taken in the valley of Frazer Creek, six miles north of Berthoud's Pass, and at a height of about 10,000 feet, Sept. 13th; another at Hot Sulphur Springs, Middle Park, Sept. 16th, and a third at Valmont, on the plains. It was not uncommon at Empire City where it was very fond of the yellow thistle.

Egeriadae.

Four or five species of *Egeria* (or *Sesia*) were collected at Empire City in July and August, of which none have been determined.

Scepsis fulvicollis, Walk.

One specimen was taken at Valmont in July.

Gnophæla vermiculata, Grote.

Quite common in the vicinity of Empire City, between 9,000 and 10,000 feet. They were usually found on yellow flowers.

Anatolmis grotei, Packard.

One specimen near Georgetown, July 30th.

Lithosia argillaceæ, Pack.

One specimen taken near Empire City, July 17th.

Crocata quinnaria, Grote.

One specimen from Empire City, between July 9th and 20th, and another from near Georgetown, July 20th.

Arctia ——— sp.?

One specimen from above timber-line on Mount Flora, July 17th. This may possibly prove to be *A. quenselii*, Payk.

Nemophila near *petrosa*, Walk. (One of the many forms of *Nemophila plantaginis*, Linn.)

One specimen was taken in a wild strawberry patch, near Empire City, July 18th.

Hemiteuca nevadensis, Stretch.

One specimen taken at Canon City in October. It was noticed frequently, flying about the streets, in Denver and Canon City.

Report on the Insects collected by Captain Jones' Expedition to Northwestern Wyoming in 1873.

BY J. D. PUTNAM.

While connected with Captain Jones' Expedition to Northwestern Wyoming in 1873, I endeavored to make a small collection of insects. Having responsible meteorological duties to perform at all times, and being almost constantly on the march, I had but little chance left for collecting insects. Always having a bottle of alcohol about me, I took whatever came in my way, thus obtaining a very fair number of Coleoptera while the other orders are very meagerly represented in the collection. Crossing the Green River sage plains in June, we found the insect life quite sparse. Most of the collection under this head was made at Fort Bridger before starting. On the top of a butte just north of Little Sandy Creek I was surprised on turning over a stone to find three scorpions, under another stone I found one more. Later in the season I found two more scorpions on the banks of Dry Creek, north of Wind River. I was not aware that they had ever been found so far north before. The large region of country drained by the Wind and Bighorn Rivers I do not think has ever been explored by the entomologist. It seems to be specially favorable to the development of the Orthoptera. While camped near Camp Brown in July, our beds swarmed with a species of *Stenopelmatus*, thus furnishing amusement to some members of the survey in arranging sanguinary fights, for these insects are very pugnacious. *Anabrus simplex* Hald. abounded on the plains along the base of the Wind River Mts. As we crossed the broad grassy plain to the Stinkingwater River on July 26th, we found it swarming with *Caloptenus spretus*. Butterflies were very scarce except in some of the mountain valleys. The region about the headwaters of Owl Creek and Gray Bull River will undoubtedly yield many interesting species when it is examined. In the Yellowstone Park and especially in the valley of Fire Hole River the numerous springs and boggy nature of the soil are very favorable for the development of Neuroptera. I was not however able to collect much. In the Yellowstone Park we found the gnats, mosquitoes, and a large species of horse fly very abundant and unrelenting in their attacks upon man or beast. It was always a puzzle to know what so many of them could find to live on when we were not there. At our camp on

Dry Sandy we were much annoyed one sultry evening in June by the presence of great numbers of a very small species of fly called by the very indefinite name of "buffalo gnat." They did not bite but were very annoying. A sudden change of wind in the night drove them off.

Of the reptiles several horned toads were collected. They were quite abundant among the sage brush. In the whole of the Wind River valley we have found rattle snakes very abundant. I collected the fresh water and land shells whenever I could do so but they were very scarce everywhere.

While at Camp Brown on our return I showed some of my insects to three Shoshone Indians who came into my tent and obtained from them the names as well as I could.

I am much indebted to Captain Jones for the interest which he took in my work and to all the members of the party for many favors. A list of the Coleoptera was published in the Report of the Expedition last year. It is repeated here with some changes and additions.

Hymenoptera.

UROCERIDÆ.

Urocerus abdominalis, ♀ ♂. Wind River, Stinkingwater River.
Called An-e-goot-tsee, by the Shoshone Indians.

TENTHREDINIDÆ.

Dolerus aprillus, *Norton*. Green River.
Selandria nubilipennis, *Norton*. Fort Bridger.
One or two undetermined species. Wind River.

ICHNEUMONIDÆ.

Ichneumon propinquus, *Cress*. Green River.
Pezomachus, ——— *sp.*? Green River.
Cryptus tejonensis, *Cress*.? Fort Bridger.
Ophion bilineatus, *Say*. Fort Bridger, Green River.
Mesochorus agilis, *Cress*. Green River.
Limneria ——— *sp.*? Green River.
Cremastrus ——— *sp.*? Wind River.

BRACONIDÆ.

Chelonus sericeus, *Say*. Wind River.
Microgaster ——— *sp.*? Fort Bridger.
Bracon ——— *sp.*? Fort Bridger.

CHALCIDIDÆ.

Three species. Fort Bridger, Wind River.

MUTILIDÆ.

Mutilla californica, *Rad*. Wind River.
Mutilla coccineohirta, *Blake*. Yellowstone National Park.

FORMICIDÆ.

A few unstudied species.

VESPIDÆ.

Vespa maculata, Linn.

Snake River.

APIDÆ.

Melissodes honesta, Cress.

Green River.

Bombus fervidus, Fab.

Fort Bridger.

Bombus ternarius, Say.

Fort Bridger.

Lepidoptera.

Papilio zolicaon, Boisd.

Two specimens, (♂♂) were taken July 22d, near our camp (No. 27) on Mee-ye-ro Creek, a tributary of the Big Horn River among the eastern spurs of the massive Sierra Shoshone Mts.

Colias Alexandra, Edw.

One specimen taken on a grassy bottom in the Canon of Stinking-water River in the latter part of July.

Argynnis Edwardsii, Reakirt.

Two specimens were taken somewhere in the valley of Wind River in July.

Argynnis Freya, Thub.

One specimen. Wind River Valley, July.

Phyciodes —sp?

One specimen. Wind River Valley. July.

Coenonympha ochracea, Edw.

One specimen taken between Fort Bridger and South Pass in July.

Satyrus charon, Edw.

Two specimens. Wind River Valley. July.

Ochinobas chryxus, Doubl. Hew.

One specimen taken in the Yellowstone National Park during August.

Lycæna antægon, Boisd.

One specimen from the Wind River Mountains near Camp Brown in the latter part of June.

Arctia Yarrowii, Stretch.

A single pair, (♂♀) were obtained high up above timberline on Washakie's Needles—a lofty peak at the source of Owl Creek, rise to a height of over 13,000 feet.

Pseudohazis pica, Walker.

A single individual of this beautiful moth was captured August 18th, near Barronett's bridge across the Yellowstone River.

Hepialus Hyperboreus, Möschler (1862) (*H. Pulcher*, Grote, 1864).

One specimen probably of this species was taken in the Yellowstone National Park during August.

Coleoptera.

I. GREEN RIVER BASIN: FORT BRIDGER. MAY AND JUNE.

<i>Cicindela tranquebarica</i> , <i>Herbst.</i>	<i>Phalacrus penicillatus</i> , <i>Say.</i>
<i>Elaphrus californicus</i> , <i>Mann.</i>	<i>Hippodamia Lecontei</i> , <i>Muls.</i>
<i>Carabus Agassizii</i> , <i>Lec.</i>	<i>Hippodamia parenthesis</i> , <i>Say.</i>
<i>Lebia guttula</i> , <i>Lec.</i>	<i>Coccinella novem notata</i> , <i>Herbst.</i>
<i>Philotecnus nigricollis</i> , <i>Lec.</i>	<i>Saprinus pratensis</i> , <i>Lec.</i>
<i>Platynus chalceus</i> , <i>Lec.</i>	<i>Aphodius occidentalis</i> , <i>Horn.</i>
<i>Pterostichus protractus</i> , <i>Lec.</i>	<i>Aphodius denticulatus</i> , <i>Hald.</i>
<i>Pterostichus luzotii</i> , <i>Dej.</i>	<i>Trox alternans</i> , <i>Lec.</i>
<i>Amara lacustris</i> , <i>Lec.</i>	<i>Lachnosterna fusca</i> , <i>Frohl.</i>
<i>Chlaenius sericeus</i> , <i>Forst.</i>	<i>Collops vittatus</i> , <i>Say.</i>
<i>Bradycellus cognatus</i> , <i>Gyll.</i>	<i>Collops cribratus</i> , <i>Lec.</i>
<i>Harpalus amputatus</i> , <i>Say.</i>	<i>Dolichosoma foveicollis</i> , <i>Kirby.</i>
<i>Harpalus funestus</i> , <i>Lec.</i>	<i>Dasytes brevisculus</i> , <i>Motsch.</i>
<i>Harpalus stupidus</i> , <i>Lec.</i>	<i>Galeruca americana</i> , <i>Fabr.</i>
<i>Harpalis furtivus</i> , <i>Lec.</i>	<i>Graptodera inærata</i> , <i>Lec.</i>
<i>Harpalus obesulus</i> , <i>Lec.</i>	<i>Monoxia guttulata</i> , <i>Lec.</i>
<i>Bembidium lucidum</i> , <i>Lec.</i>	<i>Eleodes hispilabris</i> , <i>Say.</i>
<i>Bembidium umbratum</i> , <i>Lec.</i>	<i>Eleodes extricata</i> , <i>Say.</i>
<i>Aleochara bimaculata</i> , <i>Grav.</i>	<i>Eleodes nigrina</i> , <i>Lec.</i>
<i>Philonthus</i> , <i>no name.</i>	<i>Blapstinus pratensis</i> , <i>Lec.</i>
<i>Silpha lapponica</i> , <i>Herbst.</i>	<i>Notoxus subtilis</i> , <i>Lec.</i>
<i>Dermestes marmoratus</i> , <i>Say.</i>	<i>Sphenophorus Ulkei</i> , <i>Horn.</i>
<i>Dermestes caninus</i> , <i>Germ.</i>	

II. WIND RIVER BASIN: STINKINGWATER RIVER. JULY.

<i>Calosoma luxatum</i> , <i>Say.</i>	<i>Acmæops subpilosa</i> , <i>Lec.</i>
<i>Carabus Agassizii</i> , <i>Lec.</i>	<i>Acmæops pratensis</i> , <i>Laich.</i>
<i>Lebia guttula</i> , <i>Lec.</i>	<i>Monohammus scutellatus</i> , <i>Say.</i>
<i>Silpha ramosa</i> , <i>Say.</i>	<i>Saxinis saucia</i> , <i>Lec.</i>
<i>Nitidula ziczac</i> , <i>Say.</i>	<i>Adoxus vitis</i> , <i>Linn.</i>
<i>Phaclarus penicillatus</i> , <i>Say.</i>	<i>Disonycha alternata</i> , <i>Ill.</i>
<i>Hippodamia 5-signata</i> , <i>Kirby.</i>	<i>Luperus longulus</i> , <i>Lec.</i>

<i>Coccinella trifasciata</i> , Linn.	<i>Eleodes obscura</i> , Say.
<i>Coccinella 9-notata</i> , Herbst.	<i>Eleodes hispilabris</i> , Say.
<i>Hoplia laticollis</i> , Lec.	<i>Eleodes extricata</i> , Say.
<i>Serica curvata</i> , Lec.	<i>Eleodes pimelioides</i> , Mann.
<i>Serica frontalis</i> , Lec.	<i>Corphyra Lewisii</i> , Horn.
<i>Polyphylla 10-lineata</i> , Say.	<i>Notoxus serratus</i> , Lec.
<i>Melanophila longipes</i> , Say.	<i>Anaspis rufa</i> , Say.
<i>Chrysobothris</i> —sp?	<i>Epicauta puncticollis</i> , Mann.
<i>Acmæodera mixta</i> , Lec.	<i>Epicauta sericans</i> , Lec.
<i>Brachys terminous</i> , Fab.	<i>Epicauta maculata</i> , Say.
<i>Pristocellus near fuscus</i> , Lec.	<i>Lytta fulgifera</i> , Lec. variety of Nut-
<i>Listrus interruptus</i> , Lec.	tali, Say.
<i>Dolichosoma foveicollis</i> , Kirby.	<i>Lepyrus colon</i> , Linn.
<i>Prionus californicus</i> , Motsch.	

III. YELLOWSTONE NATIONAL PARK. AUGUST.

<i>Cicindela 12-guttata</i> , Dej.	<i>Melanophila longipes</i> , Say.
<i>Nebria hudsonica</i> , Lec.	<i>Corymbites tinctus</i> , Lec. Black
<i>Pterostichus protractus</i> , Lec.	variety.
<i>Amara patricia</i> , Dej.	<i>Criocephalus productus</i> , Lec.
<i>Harpalus funestus</i> , Lec.	<i>Criocephalus asperatus</i> , Lec.
<i>Bembidium nebraskense</i> , Lec.	<i>Oxoplus corallinus</i> , Lec. variety.
<i>Dytiscus marginicollis</i> , Lec.	<i>Pachyta liturata</i> , Kirby.
<i>Creophilus villosus</i> , Grav.	<i>Trirhabda attenuata</i> , Say. variety.
<i>Coccinella picta</i> , Rand.	<i>Coelocnemis dilaticollis</i> , Mann.
<i>Coccinella trifasciata</i> , Linn.	<i>Corphyra lugubris</i> , Say.
<i>Coccinella transverso guttata</i> , Fald.	<i>Cephaloon lepturides</i> , Newm. var.

Neuroptera.

The following *Neuroptera*, collected on the expedition, have been determined by Dr. H. A. Hagen of Cambridge.

Pteronarchys californica.
Polystoechotes punctatus.
Myrmileon diversus.
Myrmileon impressus.
Platyphylax atripes.
Platyphylax designata.
Ephemera. (Too bad for determination.)
Chloroperla. One species.
Hemerobius. One species.
Gramotanlius, n. sp. One specimen.

Indian Names for Insects.

The following words, used by the Shoshone or Snake Indians to designate insects, were obtained September 14, 1873, at Camp Brown, Wyoming Territory, from Moonharvey, Charlie, and Bob, three Shoshone Indians, belonging to Washakie's band. With a few exceptions they did not seem to be very familiar with the names, but had to consult together. For many others they could give me no name.

Large wingless cricket, (<i>Anabrus simplex</i> .)	Mesch.
Black cricket, (<i>Gryllus</i> — sp?)	Mesh; Mes-oo-wan-ich.
Sand cricket, (<i>Stenopelmatus</i> .)	Nen-i-gui-po.
Pupa of a large grasshopper, (<i>Edipoda</i> .)	At-tung.
Large grasshopper, (<i>Edipoda</i> .)	A-dun-ich.
Hateful grasshopper, (<i>Calaptenus spretus</i> .)	Ud-see-gnee.
Stink beetle, (<i>Colocnemus dilaticollis</i> .)	Bee-sou-guah.
California borer, (<i>Prionus Californicus</i>)	Gon-i-pee-ah.
Green Buprestid, (<i>Chrysobothris</i> .)	Eh-wee-et.
Horse fly, (<i>Tabanus</i> .)	Bee-meet.
Common fly, (<i>Musca</i> .)	An-e-ou or An-e-vou.
Horntail, (<i>Urocerus abdominialis</i> .)	An-e-goot-see.
Cicada, (sp?)	Kue-ah.
Ant Lyon, (<i>Myrmoleon</i> .)	Es-pou-see.
Day fly, (<i>Ephemera</i> .)	Moo-po.
Various diurnal butterflies and moths.	A-e-pril.
Yellow butterfly, (<i>Colias Alexandra</i>)	O-a-bit A-e-pril.
Large brown caterpillar, (larva of some <i>Sphingids</i> .)	Beer-waub.
Moths, [<i>Arctia Yarrowii</i> , Stretch.]	Un-dwust.
Horned toad, [<i>Phrysonomia</i> .]	A-matz-ing-a-ha.

COLORS.

White,	Tos-it-eh.
Black,	Tou-or-wit.
Brownish black,	Tou-gon-dau-bit.
Brown,	Tou-gon-umph.
Red,	En-ga-bit.
Yellow,	Orbt [O-a-bit.]
Green,	Ah-went.
Blue [bright],	Tsoi-woo-it.
Blue [dull],	Ah-woo-it.

Report on the Insects collected in the vicinity of Spring Lake Villa, Utah Co., Utah, during the Summer of 1875.

BY J. D. PUTNAM.

During the past summer I again accompanied Dr. C. C. Parry on a trip to the Rocky Mountains. This time we located our headquarters on the edge of the sage brush plain, 5,000 feet above the sea level, a few miles north of Mount Nebo and about an equal distance from Utah Lake, at the delightful little fruit-growing settlement of Spring Lake Villa, seventy-five miles south of Salt Lake City. Here a large group of springs gushing from the base of the abrupt mountains furnished an abundant supply of water, making a beautiful oasis in the surrounding desert. Thus the conditions were favorable for a large development of insect life. Here we spent the greater part of July, August and September, and though quite an invalid most of the time, I was enabled to make a very fair collection, being greatly aided by the kind attention of Mr. B. F. Johnson and his boys. During August we spent several weeks high up in Summit Canon several miles north of Mount Nebo and about 8,000 feet above the sea. I was twice able to ascend to points over 10,000 feet high. As will be seen by the accompanying lists the fauna here differs considerably from that below. On the 5th of July we made a short visit to the shores of the southern extremity of Utah Lake. On a salty mud flat left by the evaporating waters I found a remarkable array of beetles, mostly Carabidae, running actively about over the salty mud in the hot sun. In the course of about two hours I collected 600 specimens of 39 species, of which two at least have proved to be new and others were of great rarity.

In making out the list of Coleoptera I have kept the species from each of the above three localities separate. I am indebted again to Mr. Henry Ulke for the determination of the names and many other favors.

Owing to ill health, I did not make nearly so good a collection of the Lepidoptera and Neuroptera as the opportunities afforded. The few Lepidoptera which I was able to preserve were very kindly named for me, by Mr. Henry Edwards, while I was in San Francisco last fall. They were also examined by Dr. H. Behr and Mr. R. H. Stretch, whose kind attentions will long be remembered. I have inserted in the list the names of a few familiar butterflies which were noticed but not collected. The Neuroptera were sent to Dr. H. A. Hagen, at Cambridge, and his report indicates an interesting fauna. The Orthoptera have been sent to Dr. Cyrus Thomas for determination, but no return has yet been received. The Hymenoptera of which many handsome species were found, have been determined by Mr. E. T. Cresson, who describes *Nomada Putnamii* as new. Considerable collections of the other orders of Insects, (Diptera, Hemiptera, Arachnida, etc.) were made, as well as of Shells and Reptiles, but these I have not yet had the means of studying.

Hymenoptera.**URO CERIDÆ.***Urocerus cyaneus, Fab.***ICHNEUMONIDÆ.***Ichneumon pedalis, Cress.**Limneria*, four or five undetermined species.*Ichneumon inconsians, Cress.***BRACONIDÆ.***Microgaster* — *sp?**Bracon*, four or five undetermined species.**MUTILLIDÆ.***Mutilla californica, Rad.**Mutilla coccineohirta, Blake.***SCOLIADÆ.***Tiphia albilabrus, St. Farg.***FORMICARIÆ.**

Several undetermined species were collected.

NYSSONIDÆ.*Stizus nevadensis, Cress.**Larra uncinata, Say.***PHILANTHIDÆ.***Philanthus frontalis, Cress.**Cerceris pedalis, Cress.***CRABRONIDÆ.***Trypoxylon frigidum, Smith.***BEMBECIDÆ.***Bembex fasciata, Say.**Monedula ventralis, Say.***LARRIDÆ.***Larrada terminata, Smith.**Tachytes abdominalis, Say.***SPHEGIDÆ.***Ammophila vulgaris, Cress.**Pelopoens cæruleus, Linn.**Ammophila communis, Cress.**Pelopoens cementarius, Drury.**Ammophila varipes, Cress.**Sphex ichneumoneus, Fabr.**Ammophila luctuosa, Smith.**Sphex læviventris, Cress.***PAMPILIDÆ.***Priocnemis terminatus, Say.**Pepsis marginata, Fabr.***EUMONIDÆ.***Odynerus tigris, Sauss.**Odynerus annulatus, Say.***VESPIDÆ.***Vespa diabolica, Sauss.**Vespa arenaria, Fabr.**Vespa occidentalis, Cress.**Pollistes variatus, Cress.**Vespa maculata, Linn.*

ANDRENIDÆ.

<i>Colletes americana</i> , Cress.	<i>Agapostemon radiatus</i> , Say.
<i>Colletes</i> ——— <i>sp.</i> ?	<i>Agapostemon texanus</i> , Cress.
<i>Agapostemon nigricornis</i> , Fab.	<i>Sphecodes</i> ——— <i>sp.</i> ?

APIDÆ.

<i>Osmia megacephala</i> , Cress.	<i>Melissodes densa</i> , Cress.
<i>Megachile pruina</i> , Smith.	<i>Melissodes</i> ——— <i>sp.</i> ?
<i>Megachile exilis</i> , Cress.	<i>Anthophora occidentalis</i> , Cress.
<i>Megachile</i> ——— <i>sp.</i> ?	<i>Anthophora terminalis</i> , Cress.
<i>Anthidium interruptum</i> , Say.	<i>Bombus flavifrons</i> , Cress.
<i>Nomada Putnamii</i> , Cress. (<i>N. Sp.</i>)	<i>Bombus separatus</i> , Cress.
<i>Epeolus lunatus</i> , Say.	<i>Bombus</i> ——— <i>sp.</i> ?
<i>Ceratina dupla</i> , Say.	<i>Apis mellifica</i> , Linn.
<i>Melissodes pruinosa</i> , Say.	

Lepidoptera.

RHOPALOCERA.

Papilio turnus, Linn.

One specimen of this or an allied species was collected at Spring Lake, July 9. It was not uncommon.

Papilio zolicaon, Boisd.

This species was noticed several times on the sage brush plain near the base of the mountains, but was not collected.

Parnassius clarius, Boisd.

Quite common during August in Summit Canon, from 8,000 to 10,000 feet altitude. Mr. Edwards marked this species *P. clodius*, but according to the figures in W. H. Edwards' *Butterflies of North America* it is certainly *clarius*. Most likely they are both the same species.

Pieris oleracea, Boisd.

Very abundant in Summit Canon, at 8,000 feet, but was not noticed elsewhere, either on the plains or high up on the mountains. The specimens collected are almost entirely pure white, most of them having scarcely any trace even of black atoms at the base of the wing. One specimen only has a very little black at the apex and a little more at the base and along the cost of the anterior wings.

Pieris protodice, Boisd.

Common at Spring Lake in July. Two specimens.

Pieris occidentalis, Reakirt.

Quite common in Summit Canon and high up on the mountains during August. This species and the preceding look a good deal alike.

Colias keewayden, Edw.

Not very abundant at Spring Lake and quite rare in Summit Canon.

Colias Scudderii, Reakirt.

One specimen from the north slope of Mount Nebo at 9,000 feet, August 23d.

Danaus erippus, Cram.

Moderately abundant at Spring Lake during August and September.

Argynnis Edwardsii, Reakirt.

One specimen from Spring Lake Villa, September 8. This specimen is much larger and rather brighter colored than the figures on Plate XI of Edwards's Butterflies of North America.

Argynnis eurynome, Edw.

Quite common in Summit Canon, but difficult to capture on account of the steep slopes of the mountains. Some of the specimens appear more like *A. Neodensis*, and there may have been other species.

Melitæa nubigena, Behr.

Quite common in Summit Canon and on the surrounding mountains during August. One specimen larger and rather differently marked may be another species.

Phyciodes — sp.?

One specimen Summit Canon, August.

Phyciodes — sp.?

One specimen Summit Canon, August. These two species, which are quite different, were not uncommon.

Grapta satyrus, Edw.

One specimen was taken at Spring Lake Villa, July 9th.

Grapta zephyrus, Edw.

One specimen was taken in a side gulch from Summit Canon, 9,000 feet above the sea, August 19th.

Vanessa antiops, Linn.

Not uncommon at Spring Lake during July and August, but was not collected.

Vanessa miobertii, Godt.

Observed occasionally in Summit Canon, but I was unable to get a specimen on account of its rapid irregular flight among fallen timber.

Pyrameis cardui, Linn.

Common at Spring Lake in July.

Elmönitis Weidemeyerii, Edw.

Tolerably common in Summit Canon during August.

Limenitis missipus, Fabr.

A few specimens of this species were seen at Spring Lake during September, but none were collected.

Satyrus charon, Edw.

One specimen from the summit of a bare rocky point at the head of Summit Canon, August 19th.

Thecla chrysalis, Edw.

One specimen only of this pretty species was taken in Summit Canon, August 8th.

Chrysophanus virginensis, Edw.

One specimen taken in Summit Canon, August 21st.

Chrysophanus helloides, Boisd.

Not uncommon in Summit Canon and on the surrounding mountains.

Chrysophanus viridis, Edw.

Found also in Summit Canon and on the surrounding mountains.

Lycena heteronea, Boisd.

Quite common among flowers in Summit Canon. The females of this species and the above species of *Chrysophanus* all look very much alike.

Lycena Pheres, Boisd.

One specimen was taken in Summit Canon.

Lycena exilis, Boisd.

I found this very pretty little species quite common among the salt weeds growing along the shores of Utah Lake, in September.

Gonitoba tityrus, Fabr.

Common in the flower garden at Spring Lake Villa.

Pyrgus tessellata, Scud.

Very common in Summit Canon, flying swiftly up and down the road close to the ground and very difficult to capture.

Pamphila — sp?

Two specimens collected in Summit Canon in August, where it is quite common.

HETEROCERA.

Deiliphila lineata, Fabr.

Common in the flower garden at Spring Lake Villa in September.

Eudryas unio, Hübner.

A single specimen was taken at Spring Lake Villa in July,

Gnaphaia vermiculata, Grote.

Remarkably abundant in Summit Canon, at, from 7000 to 9000 feet altitude, during the first two weeks in August. The little brooks were in places almost dammed up with the dead bodies which had fallen in. They seemed to prefer flowers of a yellow color, but were found on almost everything. Great numbers were in *coito*. In the cool of the evening and early morning they were generally rather sluggish and hung heavily to the plant on which they rested. In the heat of the day they were more active and would fly readily. Thousands of specimens might easily have been gathered in a few hours. One or two specimens were collected at Spring Lake Villa at the base of the mountains and one was brought to me from Utah Lake—ten miles distant. The first specimen was collected July 27th in Summit Canon. This species, which I have also found plentiful at Empire City, Colorado, is very uniform in its variations. In a considerable number of specimens from both localities the two white patches are connected behind the base of the third median nervule, while in other specimens this dividing black band is quite broad and has the edges smooth; and there is nearly every degree of blackness between. All of my specimens without exception have the ground color of the wings greenish, and not yellowish white. They vary in size, without regard to sex from 1.6 inches to 2.2 inches expanse of wings. I have noticed no other important variation.

Pseudohazies eglanterina, Boisdu.

One female was taken at our camp in Summit Canon at 8,000 feet on August 7th. On August 9th I found it quite abundant and active, on the very summit of a high rocky point at the head of Summit Canon and about three miles northeast of Mount Nebo. This point, which is not less than 10,500 feet above the sea, formed a congregating place for large numbers of Lepidoptera of various species—*Parnassius*, *Pieris*, *Argynnis*, *Melitæa*, *Satyrus*, *Lycæna*, *Pseudohazies*, etc. I several times noticed this species on other high points in the vicinity, but never at a lower altitude. At Spring Lake I several times saw a moth, always flying over the house, very much resembling this species but white instead of yellow. It is probably the same species which I took in August, 1873, on the Yellowstone River—probably *Pseudohazies picta*, Walk.

Oligiocampa sylvatica, Harr.

One specimen probably of this species was taken at Spring Lake Villa. July.

Catocala faustina, Strecker.

A number of specimens were seen at Spring Lake in September, and also among the oak brush in the lower part of Summit Canon. But one specimen was collected.

Coleoptera.**I. THE MOUNT NEBO ALPINE REGION 7,000 TO 10,000 FT. IN ALTITUDE****CICINDELIDÆ.**

Cicindela 12 guttata, *Dej.*

CARABIDÆ.

<i>Nebria Mannerheimii</i> , <i>Fisch.</i>	<i>Harpalus pensylvanicus</i> , <i>Dej.</i>
<i>Carabus Agassizii</i> , <i>Lec.</i>	<i>Bembidium funereum</i> , <i>Lec.</i>
<i>Calathus dubia</i> , <i>Lec.</i>	<i>Bembidium nevadense</i> , <i>Ulke.</i>
<i>Platymus strigicollis</i> , <i>Mann.</i>	<i>Bembidium lucidum</i> , <i>Lec.</i>
<i>Pterostichus protractus</i> , <i>Lec.</i>	

HYDROPHILIDÆ

Tropisternus glaber, *Herbst.*

STAPHYLINIDÆ.

<i>Aleochara bimaculata</i> , <i>Grav.</i>	<i>Philonthus cautus</i> , <i>Er.</i>
<i>Quedius</i> , <i>no name.</i>	<i>Platystethus Americanus</i> , <i>Er.</i>

DERMESTIDÆ

Orphilus glabratus, *Er.*

COCCINELLIDÆ.

<i>Hippodamia 5-signata</i> , <i>Kirby.</i>	<i>Coccinella 9-notata</i> , <i>Herbst.</i>
<i>Hippodamia Lecontei</i> , <i>Muls.</i>	<i>Coccinella transversalis</i> , <i>Muls.</i>
<i>Hippodamia parenthesis</i> , <i>Say</i> , var. <i>Anatis Rathvoni</i> , <i>Lec.</i> variety.	
<i>Coccinella difficilis</i> , <i>Crotch.</i>	

HISTERIDÆ.

<i>Saprinus plenus</i> , <i>Lec.</i>	<i>Saprinus oregonensis</i> , <i>Lec.</i>
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SCARABÆIDÆ.

<i>Aphodius</i> , <i>n. sp.</i>	<i>Diplotaxis liberta</i> , <i>Germ.</i>
Perhaps a large variety of <i>A. coloradensis</i> , <i>Horn.</i>	

BUPRESTIDÆ.

<i>Buprestis maculiventris</i> , <i>Say.</i>	<i>Melanophila longipes</i> , <i>Say.</i>
<i>Buprestis rusticorum</i> , <i>Kirby.</i>	

ELATERIDÆ.

Cryptohypnas bicolor, *Esch.*

LAMPYRIDÆ.

Photinus californicus, *Motsch.*

MALACHIDÆ.

Listrus senilis, *Lec.*

CLERIDÆ.

Clerus ornatus, *Say.* A variety with bright red bands.

Corynetes violaceus, *Linn.*

CERAMBYCIDÆ.

Leptura obliterata *Hald.?*

Leptura chrysocoma, *Kirby.*

Leptura propinqua, *Bland.*

Monohammus scutellatus, *Say.*

Leptura subargentina, *Kirby.*

CHRYSOMELIDÆ.

Saxinis Saucia, *Lec.*

Trirhabda canadensis, *Kirby.*

Adoxus vittis, *Linn.*

Orchestris Zimmermanni, *Crotch.*

Galeruca externa, *Say.*

Orchestris albionica, *Lec.*

Found in abundance on a solitary lupine at 10,000 feet.

TENEBRIONIDÆ.

Eleodea pimelioides, *Mann.*

MORDELLIDÆ.

Pentaria fuscula, *Lec.* varieties.

Anaspis rufa, *Say.*

Anaspis atra, *Lec.*

Mordella scutellaris, *Fabr.*

MELOIDÆ.

Epicauta puncticollis, *Mann.*

Nemognatha apicalis, *Lec.*

Epicauta fissilabrus, *Horn.*

CURCULIONIDÆ.

Ceutorrynchus, *no name.*

II. SALT MUD FLAT NEAR UTAH LAKE.

CICINDELIDÆ.

Cicindela 12-guttata, *Dej.*

Cicindela senilis, *Horn.*

CARABIDÆ.

Elaphrus Lecontei, *Crotch.*

Pogonus depressus, *Lec. N. Sp.*

Dyschirius salivagens, *Lec. N. Sp.*

Bembidium cordatum, *Lec.*

Dyschirius patruelis, *Lec.*

Bembidium umbratum, *Lec.*

Lebia viridis, *Say.*

Bembidium pictum, *Lec.*

Blechnus lucidus, *Lec.*

Bembidium vile, *Lec.*

Harpalus amputatus, *Say.*

Bembidium 6-punctatum, *Lec.*

Stenololophus anceps, *Lec.*

Tachys corax, *Lec.*

DYTISCIDÆ.

- Hydroporus cinctellus*, *Lec.* *Rhantus binotatus*, *Harr.*
Laccophilus decipiens, *Lec.*

HYDROPHILIDÆ.

- Hydrobius subcupreus*, *Say.*

STAPHYLINIDÆ.

- Philonthus paederoides*, *Lec.* *Paederus compotens*, *Lec.*
Bledius n. sp. near *cordatus*, *Say.*

SILPHIDÆ.

- Peltis* (*Silpha*) *ramosa*, *Say.*

DERMESTIDÆ.

- Dermestes marmoratus*, *Say.* *Dermestes nubilus*, *Say.*

COCCINELLIDÆ.

- Hippodamia* *13-punctata*, *Linn.*

HETEROCERIDÆ.

- Heterocerus cuniculus*, *Kics.*

ELATERIDÆ.

- Drasterius elegans*, *Fabr.*

LAMPYRIDÆ.

- Photinus californicus*, *Motsch.* var.

MALACHIDÆ.

- Collops vittatus*, *Say.*

CHRY SOMELIDÆ.

- Pachybrachys caelatus*, *Lec.* *Chaetocnema subviridis*, *Lec.*
Galerucella morosa, *Lec.* *Chaetocnema confinis*, *Crotch.*

TENEBRIONIDÆ.

- Blapstinus moestus*, *Mels.* western variety,

ANTHICIDÆ.

- Anthicus rejectus*, *Lec.* *Tanarthrus salicola*, *Lec.* (*n. sp.*)

MORDELLIDÆ.

- Mordelista pustulata*, *Mels.*

NOTE.—*Dyschirius salicagens* and *Tanarthrus salicola* are described from specimens collected by me, by Dr. LeConte, in the Transactions of the American Entomological Society, Nov., 1875, page 169-174. He however, gives a wrong locality, for Utah Lake is about 75 miles south of Salt Lake.

III. THE SAGE BRUSH REGION; MOSTLY IN THE VICINITY OF SPRING LAKE VILLA, 4,000 TO 6,000 FEET IN ALTITUDE.

CICINDELIDÆ.

Cicindela tranquebarica, *Herbst.* *Cicindela near purpurea*, *Oliv.*
Cicindela 12-guttata, *Dej.*

CARABIDÆ.

<i>Brachynus stygicornis</i> , <i>Say.</i>	<i>Harpalus herbivagus</i> , <i>Say.</i>
<i>Aphelogenia guttula</i> , <i>Lec.</i>	<i>Harpalus fraternus</i> , <i>Lec.</i>
<i>Metabletus Americanus</i> , <i>Dej.</i>	<i>Harpalus funestus</i> , <i>Lec.</i>
<i>Pterostichus scitulus</i> , <i>Lec.</i>	<i>Bembidium bifossulatum</i> , <i>Lec.</i>
<i>Pterostichus mutus</i> , <i>Say.</i>	<i>Bembidium nebraskense</i> , <i>Lec.</i>
<i>Amara (Lirus) laticollis</i> , <i>Lec.</i>	<i>Bembidium lucidum</i> , <i>Lec.</i>
<i>Amara (Lirus)</i> , <i>no name.</i>	<i>Bembidium cordatum</i> , <i>Lec.</i>
<i>Amara fallax</i> , <i>Lec.</i>	<i>Bembidium rapidus</i> , <i>Lec.</i>
<i>Chlœnius sericeus</i> , <i>Forst.</i>	<i>Bembidium versicolor</i> , <i>Lec.</i>
<i>Agonoderus pallipes</i> <i>Fabr.</i>	<i>variety minimum</i> , <i>Lec.</i>
<i>Bradycellus californicus</i> , <i>Lec.</i>	<i>Bembidium pictum</i> , <i>Lec.</i>
<i>Harpalus amputatus</i> , <i>Say.</i>	<i>Bembidium cautum</i> , <i>Lec.</i>
<i>Harpalus caliginosus</i> , <i>Fabr.</i>	<i>Tachys corax</i> , <i>Lec.</i>
<i>Harpalus pensylvanicus</i> , <i>Dej.</i>	<i>Tachys incurvus</i> , <i>Say.</i>

HALIPLIDÆ.

Cremidotus, callosus, *Lec.*

DYTISCIDÆ.

<i>Hydroporus punctatus</i> , <i>Say.</i>	<i>Rhantus binotatus</i> , <i>Harris.</i>
<i>Hydroporus affinis</i> , <i>Say.</i>	<i>Gaurodytes griseipennis</i> , <i>Lec.</i>
<i>Cybister fimbriolatus</i> , <i>Say.</i>	<i>Gaurodytes fimbriatus</i> , <i>Lec.</i>
<i>Laccophilus decipiens</i> , <i>Lec.</i>	<i>Gaurodytes Austini</i> , <i>Crotch.</i>
<i>Dytiscus marginicollis</i> , <i>Lec.</i>	

GYRINIDÆ.

Gyrinus analis, *Say.*

HYDROPHILIDÆ.

<i>Helophorus lineatus</i> , <i>Say.</i>	<i>Tropisternus glaber</i> , <i>Herbst.</i>
<i>Hydrophilus triangularis</i> , <i>Say.</i>	<i>Laccobius agilis</i> , <i>Rand.</i>
<i>Tropisternus limbalis</i> , <i>Lec.</i>	<i>Hydrobius subcupraeus</i> , <i>Say.</i>

STAPHYLINIDÆ.

<i>Aleochara bimaculata</i> , <i>Grav.</i>	<i>Oxytelus sculptus</i> , <i>Grav.</i>
<i>Creophilus villosus</i> , <i>Grav.</i>	

SILPHIDÆ.

Silpha (Necrophorus) marginata, *Fab.*

LATRIDIDÆ.

Latridius pumilus, *Mels.*

DERMESTIDÆ.

Dermestes marmoratus, *Say.*

NITIDULIDÆ.

Cercus sericans, *Lec.*

Meligethes ruficornis, *Lec.*

COCCINELLIDÆ.

Hippodamia 5-signata, *Kirby.*

Hippodamia 13-punctata, *Linn.*

HETEROCERIDÆ.

Heterocerus pallidus, *Say.*

HISTERIDÆ.

Hister Ulkei, *Horn.*

Saprinus plenus, *Lec.*

Saprinus oregonensis, *Lec.*

LUCANIDÆ.

Dorcus mazama, *Lec.*

SCARABÆIDÆ.

Atænius abditus, *Hald.*

Cyclocephala immaculata, *Burm.*

Deplotaxis brevicollis, *Lec.*

Euryomia inda, *Linn.*

Macronoxia 10-lineata, *Say.*

BUPRESTIDÆ.

Melanophila longipes, *Say.*

Anthaxia retefer, *Lec.*

ELATERIDÆ.

Drasterius elegans, *Lec.*

TELEPHORIDÆ.

Chauliognathus basalis, *Lec.*

MALACHIDÆ.

Collops bipunctatus, *Say.*

Collops vittatus, *Say.*

CLERIDÆ.

Corynetes violaceus, *Linn.*

CERAMBYCIDÆ.

Elaphidion procerum, *Lec.*

Calloides nobilis, *Say.*

Tragidion fulvipennis, *Say.*

Tetraopes femoralis, *Lec.*

SPERMOPHAGIDÆ.

Mylabris (Bruchus) pisi, *Linn.* *Mylabris (Bruchus) fraterculus*, *Horn*

CHRYSMELIDÆ.

Cryptocephalus auratus, *Fabr.* *Trirhabda canadensis*, *Kirby*.
Pachybrachys atomarius, *Hald.* *Graptodera*, *no name*.
Chrysochus cobaltinus, *Lec.* *Orchestris Lewisii*, *Crotch*.
Monoxia debilis, *Lec.*

TENEBRIONIDÆ.

Asida elata, *Lec.* *Eleodes nigrina*, *Lec.*
Eleodes obscura, *Say* *Eleodes hispilabrus*, *Say*.
Eleodes sulcipennis, *Mann.* *Blapstinus pratensis*, *Lec.*
Eleodes extricata, *Say*.

ANTHICIDÆ.

Notoxus subtilis, *Lec.* *Anthicus nanus*, *Lec.*
Anthicus reiectus, *Lec.* *Anthicus bellulus*, *Lec.*
Anthicus cervinus, *Fabr.*

MORDELLIDÆ.

Mordellistena aemula, *Lec.* *Rhipiphorus scaber*, *Lec.* .

MELOIDÆ.

Epicauta ferruginea, *Say*. *Nemognatha bicolor*, *Lec.*
Zonitis bilineata, *Say*. *Nemognatha apicalis*, *Lec.*

CURCULIONIDÆ.

Erirrhinus, *two species*. *Sphenophorus ochreus*, *Lec.*
Dorytomus mucidus, *Say*. *Undetermined*, *two species*.
Copturus operculatus, *Say*.

Neuroptera.

The Neuroptera and Pseudo-neuroptera collected in Utah last summer have been very kindly determined for me by Dr. H. A. Hagen of the Museum of Comparative Zoology, Cambridge. He sends me the following list:

1. *Aschna interna*, ♂. Summit Canon, August. Abundant.
2. *Aschna constricta*, ♀. Summit Canon, August 8th.
3. *Aschna californica*, ♀. Utah Lake, July 6th.
4. *Plathemis subornata*, ♀. Utah Lake, July 6th.
5. *Libellula forensis*, ♀. Spring Lake, July 8th.
6. *Libellula saturata*, ♂. Spring Lake, July 10th.

7. *Libellula composita*, ♀. Utah Lake, July 10th.
8. *Mesothemis collocata*, ♀. Spring Lake, July 4th.
9. *Diplax flavibasis*, ♂♀. Utah Lake, July. Summit Canon. Aug.
- 10-13. *Agrion*. Four species Utah Lake, Spring Lake. July.
14. *Hexagonia bilineata*, Utah Lake, July 5.
15. *Polystachotes punctatus*, Spring Lake, September.
16. *Stenophylax gilvipes*, Spring Lake, July.
17. *Myrmilleon diversas*, Spring Lake, July.
18. *Myrmilleon* spec., Spring Lake, August.
19. *Chrysopa* (near *externa*), Spring Lake, July. In bad condition.

"The Agrions are not given, as my old friend Selys Longchamps is just publishing a work upon them, and I would not interfere with his nomenclature. My types are all in his hands, so I can not give you the names for Nos. 10-13. The two last belong to the subgenus *Ishmero*.

"Among your species these are new to the fauna of Utah:

1. *Æschna constricta*.
2. *Æschna californica*.
3. *Plathemis subornata*.
4. *Libellula forensis*.
5. *Libellula saturata*.
6. *Libellula composita*.
7. *Mesothemis collocata*.
8. *Diplax flavibasis*.
- 9, 10. Probably *Agrion*, 10, 12.
11. *Hexagonia bilineata*.
12. *Stenophylax*.

"But most of them (1, 4, 5, 6, 7,) I have from the Yellowstone,—the others from California. *Æschna californica*, formerly only from the far west, gives this the most eastern locality. *L. composita* is only the second specimen I have seen; the male would be very important. *D. flavibasis* I possessed for twenty years in specimens from California, but so bad that I did not describe them. In the meantime I have received this species by three collectors. The *Stenophylax* is perhaps a different species, but very near to *gilvipes*. The only specimen is not fit for description. You see your kind remittance contains important additions and I am very obliged to you."

H. A. HAGEN.

LIST OF HYMENOPTERA,

Collected by J. Duncan Putnam, of Davenport, Iowa, with
Descriptions of two New Species.

BY E. T. CRESSON, PHILADELPHIA.

URO CERIDÆ.

<i>Urocerus flavicornis</i> , <i>Fab.</i> ♀	Boulder Canon, Empire City, Col.
<i>Urocerus abdominalis</i> , <i>Fab.</i> ♂♀	Wind R., Stinkingwater R., Wyo.
<i>Urocerus cyaneus</i> , <i>Fab.</i> ♀	Spring Lake, Utah.
<i>Tremex columba</i> , <i>Fab.</i> ♀	Davenport, Iowa.

TENTHREDINIDÆ.

<i>Acordulecera dorsalis</i> , <i>Say.</i>	Davenport, Iowa.
<i>Dolerus bicolor</i> , <i>Beauv.</i>	Clear Creek, Col.
“ <i>colaris</i> , <i>Say.</i>	Davenport, Iowa.
“ <i>aprilis</i> , <i>Norton</i> ,	Empire City, Col.; Green River, Wy.
<i>Selandria nubilipennis</i> , <i>Norton.</i>	Fort Bridger, Wy.
<i>Tenthredo xanthus</i> , <i>Norton.</i>	Empire City, Col.
“ <i>pectoralis</i> , <i>Norton.</i>	Empire City, Col.
“ <i>variata</i> , <i>Norton</i> ,	Empire City, Col.
<i>Phyllaacus clavatus</i> , <i>Norton.</i>	Clear Creek, Col.

ICHNEUMONIDÆ.

<i>Ichneumon pedalis</i> , <i>Cress.</i>	Spring Lake, Utah.
“ <i>lætus</i> , <i>Cress.</i>	Davenport, Iowa.
“ <i>inconstans</i> , <i>Cress.</i>	Spring Lake, Utah.
“ <i>variegatus</i> , <i>Cress.</i>	Davenport, Iowa; Plains, Denver, Empire, Col.
“ <i>vinulentus</i> , <i>Cress.</i>	Empire City, Col.
“ <i>allapsus</i> , <i>Cress.</i>	Clear Creek, Empire City.
“ <i>Lewisii</i> , <i>Cress.</i>	Davenport, Iowa.
“ <i>propinquus</i> , <i>Cress.</i>	Empire, Col.; Green River, Wy.
“ <i>saturalis</i> , <i>Say.</i>	Empire, Col.
<i>Cryptus luctuosus</i> , <i>Cress.</i>	Empire, Col.
“ <i>tejonensis</i> , <i>Cress.</i>	Fort Bridger, Wy.
<i>Pimpla pedalis</i> , <i>Cress.</i>	Davenport, Iowa.
“ <i>inquisitor</i> , <i>Say.</i>	Monticello, Iowa.
<i>Arenetra nigrita</i> , <i>Cress.</i>	Davenport, Iowa.
<i>Exochus lævis</i> , <i>Cress.</i>	Monticello, Iowa.
“ <i>carinatus</i> , <i>Cress.</i>	Monticello, Iowa.
<i>Tryphon communis</i> , <i>Cress.</i>	Empire City, Col.
<i>Bassus sycophanta</i> , <i>Walsh.</i>	Davenport, Iowa.
“ <i>orbitalis</i> , <i>Cress.</i>	Clear Creek, Col.
“ <i>maculifrons</i> , <i>Cress.</i>	Clear Creek, Col.
<i>Exochilum mundum</i> , <i>Say.</i>	Davenport, Iowa.

Ophion bilineatus, Say. Empire and Denver, Col.; Ft. Bridger and Green River, Wy.; Davenport, Iowa.

" *purgatus*, Say.

Denver, Col.

Paniscus geminatus, Say.

Davenport, Iowa.

Mesochorus agrilus, Cress.

Green River, Wy.

Pelecinius polytluratur, Dej.

Davenport, Iowa.

BRACONIDÆ

Chelonus sericeus, Say.

Empire, Col.; Wind River, Wy.

Rogas terminatus, Cress.

Davenport, Iowa.

Toxoneuron seminigrum, Cress.

Denver, Col.

" *explorator*, Say.

Denver, Col.

Microdus fulvescens, Cress.

Denver, Col.

Agathis vulgaris, Cress.

Canon City, Col.

CHALCIDIDÆ.

Chalcis ovata, Say.

Denver and Clear Creek, Col.

MUTILLIDÆ

Mutilla gibbosa, Say. ♂

Denver, Col.

" *Camanche*, Blake. ♀

Boulder, Col.

" *californica*, Rad. ♀

Boulder and Canon City, Col.; Wind River, Wy.; Spring Lake, Utah.

" *creusa*, Cress.

Boulder, Col.

" *coccineohirta*, Blake.

Yel. Nat. Pk., Wy; Spring Lake, Utah.

" *monticola*, Cress.

Denver, Col.

" *scaevola*, Blake.

Saratoga, N. Y.

" *ferrugata*, Fabr.

Canon City, Col.

" *simillima*, Smith.

Boulder, Col.

Agama concolor, Cress.

Denver, Col.

SCOLIDÆ.

Tiphia albilabris, St. Farg.

Spring Lake, Utah.

NYSSONIDÆ.

Stizus nevadensis, Cress.

Spring Lake, Utah.

Larra uncinata, Say.

Spring Lake, Utah.

Nysson aurinotatus, Say.

Boulder, Col.

PHILANTHIDÆ.

Philanthus frontalis, Cress.

Spring Lake, Utah.

Cerceris pedalis, Cress.

Spring Lake, Utah.

" *deserta*, Cress.

Denver, Col.

CRABONIDÆ.

Trypoxylon frigidum, Smith.

Spring Lake, Utah.

BEMBECIDÆ.

<i>Bembex fasciata</i> , Say.	Spring Lake, Utah.
" <i>nubilipennis</i> , Cress.	Frederic, Monroe Co., Iowa.
<i>Monedula ventralis</i> , Say.	Spring Lake, Utah.

LARRIDÆ.

<i>Larrada argentata</i> , Beauv.	Davenport, Iowa.
" <i>terminata</i> , Smith.	Spring Lake, Utah.
" <i>montana</i> , Cress.	Plains, Col.
" <i>tarsata</i> , Say.	Denver, Col.
<i>Tachytes abdominalis</i> , Say.	Spring Lake, Utah.
<i>Astata unicolor</i> , Say.	Plains, Col.

SPHEGIDÆ.

<i>Ammophila vulgaris</i> , Cress.	Davenport, Iowa; Middle Park, Col.; Spring Lake, Utah.
" <i>communis</i> , Cress.	Plains, Empire, Clear Creek, Col.; Spring Lake, Utah.
" <i>varipes</i> , Cress.	Spring Lake, Utah.
" <i>pictipennis</i> , Walsh.	Davenport, Iowa.
" <i>ferruginea</i> , Cress.	Plains, Col.
" <i>robusta</i> , Cress.	Empire, Col.
" <i>luctuosa</i> , Smith.	Clear Creek and Canon City, Col.; Spring Lake, Utah.
<i>Pelopoeus caeruleus</i> , Linn.	Davenport, Iowa; Boulder, Col.; and Spring Lake, Utah.
" <i>cementarius</i> , Drury.	Boulder, Col.; and Spring Lake, Utah.
<i>Sphex ichneumonius</i> , Fabr.	Spring Lake, Utah.
" <i>laeviventris</i> , Cress.	Spring Lake, Utah.
<i>Priononyx atrata</i> , St. Farg.	Canon City, Col.

POMPILIDÆ.

<i>Pompilus luctuosus</i> , Cress.	• Canon City, Col.
<i>Prionemis terminatus</i> , Say.	Spring Lake, Utah.
<i>Pepsis marginata</i> , Fabr.	Spring Lake, Utah.

EUMENIDÆ.

<i>Odynerus campestris</i> , Sauss.	Davenport, Iowa.
" <i>albophaleratus</i> , Sauss.	Canon City, Col.; Davenport, Iowa.
" <i>tigris</i> , Lauss.	Spring Lake, Utah.
" <i>annulatus</i> , Say.	Spring Lake, Utah.

MASARIDÆ.

<i>Masaris vespoides</i> , Cress. ♀	Canon City, Col.
" <i>zonalis</i> , Cress. ♀	Canon City, Col.

VESPIDÆ.

- Vespa germanica*, Linn. ♂♀ Davenport, Iowa.
 " *diabolica*, Sauss. ♂ Denver, Boulder and Empire, Col.; and Spring Lake, Utah.
 " *occidentalis*, Cress. Denver, Col.; and Spring Lake, Utah.
 " *maculata*, Linn. Davenport, Iowa; Spring Lake, Utah; and Snake River, Wy.
 " *arenaria*, Fabr. Spring Lake, Utah.
Polistes variatus, Cress. ♂♀ Davenport, Iowa; Spring Lake, Utah; and Boulder, Col.
 " *pallipes*, St. Farg. Davenport, Iowa
 " *metricus*, Say. Davenport, Iowa.

ANDRENIDÆ.

- Colletes americana*, Cress. Denver, Col.; Spring Lake, Utah.
 " *albescens*, Cress. Denver, Col.
 " *consors*, Cress. Clear Creek, Col.
Augochlora pura, Say. Davenport, Iowa.
Agapostemon nigricornis, Fab. ♀ Spring Lake, Utah.
 " *radiatus*, Say. Monticello, Iowa; Spring Lake, Utah.
 " *texanus*, Cress. Boulder, Col.; Spring Lake, Utah.

APIDÆ.

- Prosopis basalis*, Smith. Canon City, Col.
 " *affinis*, Smith. Davenport, Iowa.
Osmia megacaphala, Cress. Spring Lake, Utah.
Monumetha borealis, Cress. Clear Creek, Col.
Megachile pruniae, Smith. ♂♀ Boulder, Col.; Spring Lake, Utah.
 " *exilis*, Cress. ♂ Boulder, Col.; Spring Lake, Utah.
 " *gentilis*, Cress. Boulder, Col.; and Empire, Col.
Lithurgus apicalis, Cress. Boulder, Col.
Anthidium maculifrons, Smith. Boulder, Col.
 " *interruptum*, Say. Spring Lake, Utah.
Heriades variolosa, Cress. Boulder, Col.
Nomada grandis, Cress. Canon City, Col.
 " *Putnami*, Cress. (N. Sp.) Spring Lake, Utah.
 " *maculata*, Cress. Leavenworth, Kansas.
 " *incerta*, Cress. Denver, Col.
Epeolus lunatus, Say. Spring Lake, Utah.
 " *mercatus*, Fab. Empire and Denver, Col.
Ceratina dupla, Say. Spring Lake, Utah; and Leavenworth, Kansas.
Melissodes speciosa, Cress. ♂ Denver, Col.
 " *honesta*, Cress. ♀ Green River, Wy.
 " *pruinosa*, Say. Spring Lake, Utah.
 " *menuachus*, Cress. Boulder, Col.

- " *densa*, *Cress.* Spring Lake, Utah; Boulder, Col.
Anthophora occidentalis, *Cress.* ♀ Boulder, Col.; ♂ Spring Lake, Utah.
 " *terminalis*, *Cress.* 32 Empire, Col.; Spring Lake, Utah.
 " *albata*, *Cress.* (N. Sp.) ♀ Denver, Col.
Apathus insularis, *Smith.* Empire and Clear Creek, Col.
 " *elatus*, *Fab.* Davenport, Iowa.
Bombus fervidus, *Fab.* Ft. Bridger, Wy.; Davenport, Iowa; and Spring Lake, Utah.
 " *borealis*, *Kirby.* Empire, Col.
 " *flavifrons*, *Cress.* Empire, Col.; Spring Lake, Utah.
 " *ternarius*, *Say.* Ft. Bridger, Wy.; Empire, Col.
 " *separatus*, *Cress.* Davenport, Iowa; Spring Lake, Utah.
 " *pennsylvanicus*, *DeGeer.* Davenport, Iowa.
 " *virginicus*, *Linn.* Davenport, Iowa.
Apis mellifica, *Linn.* Spring Lake, Utah; Monticello and Davenport, Iowa.

Nomada Putnami, Cresson, n. sp.

♀.—Black, shining; head evenly, not closely or strongly punctured; clypeus sparsely punctured; a large subtriangular mark on each side of face and a spot on base of mandibles, lemon-yellow; mandibles except tips, narrow posterior orbital line and three basal joints of antennæ ferruginous; thorax strongly, evenly and rather closely punctured, clothed with a yellowish pubescence, more dense on the sides and on metathorax; scutellum depressed medially; a line on prothorax, two large nearly confluent spots on scutellum, line on postscutellum, tubercles and small spot on pleura, lemon-yellow; tegulæ honey-yellow; wings clouded with fuscous, apical margin darker; stigma ferruginous, nervures fuscous; legs ferruginous, with yellowish pubescence, four posterior coxæ, each with a small yellow spot; abdomen shining, closely and finely punctured, apical margin of segments smooth and polished; the dorsal segments each with a continuous lemon-yellow subapical band, that on second segment broadly dilated laterally, the others slightly so; venter brown-ferruginous, with yellowish pubescence. Length, $4\frac{1}{2}$ lines.

♀.—Entire face except short black sutural line on each side of clypeus, labrum, base of mandibles, spot behind eyes, scape beneath, small spot beneath tubercles, knees and anterior tibiæ before, yellow; flagellum ferruginous beneath; sixth abdominal segment with a yellow band; apical segment emarginate at tip; venter blackish-brown; otherwise like the ♀.

Utah Six specimens. It give me pleasure to dedicate this handsome species to my friend J. Duncan Putnam, Esq., of Davenport, Iowa.

***Anthaphora Albata*, Cresson, n. sp.**

?.—Black, head, thorax and first abdominal segment, clothed with a rather long, dense white pubescence, shorter on mesothorax; spot beneath base of antennæ, clypeus except narrow apical margin and two large spots at base, which are black, labrum and mandibles except tips, white; antennæ short, brown; disk of mesothorax nearly destitute of pubescence, shining, finely punctured; wings short, clear hyaline, nervures black; legs brown, clothed above with short dense white pubescence, beneath it is black, especially on large basal joint of tarsi; abdomen ovate, except base of first segment, the surface above is covered with a very dense short appressed pubescence, at apical middle of fifth segment a raised patch of blackish pubescence; venter brown-black, with a few pale hairs at apex. Length $4\frac{1}{4}$ lines.

Denver, Colorado; several specimens collected by Mr. Putnam during the month of June.



List of Donations to the Museum of the Academy.

1868.

- Barler, A. U.*. A collection of Geodes and other specimens.
- Baylies, Rev. H.* Vertebra of Shark. An \$8.00 bill of old Continental currency.
- Byrnes, Dr. Thos.; Walcott, Iowa.* A specimen of cryolite.
- Challen, Rev. James* Specimens of stone and iron ore from the cofferdam on Moline chain.
- Cummings, Isaac.* Mammoth tooth from Colorado; shell rock and other specimens.
- Dubois, B. F.* Lenidodendros from Buffalo, Iowa.
- Dutton, —.* Agate from New Mexico.
- Eads, L. T.* Indian relics and minerals.
- Faught, V. R.; Hamilton, Ill.* Collection of Geodes. etc.
- Griffith, Lieut. J. E.; U. S. Lake Survey.* Deer moss from the summit of the Mamaisne mountains in British America.
- Hawkins, J. D.; Rock Island.* An arrow-head.
- Hart, W. J.* A rebel gun.
- Higday, Dr.; La Porte, Indiana.* Bog iron ore,
- Iles, Dr T. J.* Package of geological specimens from various localities.
- Laves, A. J.* Specimens of minerals.
- May, Enoch; Burlington, Iowa.* A box of crinoids.
- Parry, Dr. C. C.* Specimens of Rocky mountain woods with their seeds.
- Pratt, W. H.* Fossil coal plants and river shells.
- Riepe, Wm.* Animals preserved in alcohol.
- Ross, W. F.* Cast of a pair of fossil shells.
- Sanders, Mrs. Alfred.* A large collection of minerals, fossils and recent shells.
- Tiffany, A. S.* A collection of minerals, etc.
- Vermillion, W. D.* A fossil shell.
- Watkins, C. S.* A specimen of Franklinite.
- Wheeler, H.* Two lots of specimens of minerals, etc.
- Wilcox, Dr. H. B.; Three Oaks, Mich.* Box of fresh water shells from Galena river, Michigan.

1869.

- Barler, A. U.* A number of bird's nests and eggs. Peat from White-side county, Ill., in its natural condition and also manufactured. Lime-stone containing casts of *Pentamerus oblongus* from Maquoketa, Iowa.
- Clinton, Hon. G. W.; Buffalo, N. Y.* A large and valuable collection of named botanical specimens from Buffalo, N. Y.

- Fejervary, N.* Indian arrow-head; several glacier scratched boulders.
Francis, James. Specimens of Lignite from ——?
Gray, Wm. Specimens of granite from Scotland.
Osburn, A. Specimen of *Orydalis cornutus*.
Parker, —. Specimens of wood from the C., R. I. & P. Railroad cut, west of town.
Parkhurst, Lemuel. Specimen of some unknown substance.
Parry, Dr. C. C. Specimens of coal from various western localities.
Portland Society of Natural History, Portland, Maine. Box of Marine shells and other specimens.
Shultz, —. A butterfly.
Starbuck, D. J.; Moscow, Iowa. Specimens of a scorpion and other insects collected at Manzanilla on the west coast of Mexico.
Tiffany, A. S. Bones found buried in the soil of a prairie slough, Henry Co, Illinois.

1870.

- Cock, C. C.* Some pebbles from Ireland.
Eads, L. T. Specimen of cretaceous limestone from Nickolls Co., Neb.
Hall, H. L.; Tipton, Iowa. Specimens of coal and of a fossil oyster from California.
Iles, Dr. T. J., Cartridge shell made for the French Needle gun.
Lewis, Chas. Marine shells and whalebone.
Tiffany, A. S. Geodes and fossil fish teeth from Keokuk, Iowa.

1871.

- Ackly, L. S.* Two specimens of coal plants from Mississippi Ave., Davenport.
Sanders, Mrs. Alfred. A stuffed alligator, and also a turtle.
Gray, Wm. A stone found near Washington, Iowa.

1873.

- Barris, Prof. W. H.* Specimens of selenite crystals.
Dittoe, W. T. A fossil fern from Perry Co., Ohio.
French, G. H. Pieces of wood from excavation of D. & St. P. R. R., East Davenport.
Melville, J. H. Specimens of iron ore from Green Co., Missouri.
Myers, Dr. R. D. Corals from Monticello, Iowa.
Putnam, J. D. Specimen of Graptolites from the Utica Slate, Saratoga Co., New York.
Thorington, Hon. Jas. Seventeen skins of tropical birds.
Tiffany, A. S. A large number of geological and mineralogical specimens from Missouri.

1874.

- Balch, F. W.* Fire brick fluxed.
Baldwin, E. B. Copper implement found in excavating for new gasometer. (Plate VI, fig. 1.)
Burley, A. U. Box of fossils.
Barret, W. W.; Sheboygan, Wis. Specimen of Waverly sandstone from Elyria, Ohio.
Dodge, Mrs. W. L.; Buffalo, Iowa. Mineral specimens from Colorado.
Gray, Wm. A discoidal stone, an Indian relic.
Haines, Mrs. Mary P.; Richmond, Ind. Twenty-five species of silurian fossils.
Harrison, I. W. Example of spontaneous grafting of oak.
Putnam, Mrs. C. E. Piece of Atlantic Telegraph Cable of 1858.
Price & Hornby. Stone axe found four feet below the surface; East Davenport.
Ross, W. F. Skull from the Albany Mounds.
Sands, M. Tortoise shell and minerals.
Schumacher, Geo. Crystals of Tourmaline from Georgia. Specimens of Trilobites.
Waldron, Dr. C. F. Stone-axe weighing 12 pounds, found on Rock Island.
Wheeler, H. Cannel coal from Versailles, Morgan county, Ill.

1875.

- Ackley, J. A.* Naval cutlass captured on the rebel gunboat, "Gen. Bragg," 1862.
Baker, Mrs. Dr. Fred. Specimen of quartzite.
Balch, F. W. Specimen of gypsum from Michigan.
Barrett, Miss Lydia O. A mole (*Scalops aquaticus*).
Barrie Miss Jane. Fossil shells, etc., from Galt, Canada.
Berryhill, Col. J. H. Piece of the Atlantic cable, of 1868.
Bowman, C.; Andalusia, Ill. Collection of 41 mounted mammals birds and reptiles.
Brewster, Mrs. W. C. Large flint scraper.
Brown S. E. Specimen of native silver, from Silver Island, Lake Superior.
Burrows, Mrs. J. M. D. A stone hatchet; a shark's tooth.
Candee, Fred. Coins from Pompeii. Several specimens of cloth from Sandwich Islands. Newspapers in Hawaiian language. Specimen of native sulphur.
Collamer, Neal. Stone hatchet and bead from the Albany mounds. An Indian arrow taken out of the body of a man near Plumb Creek.
Cook, Humie. Stuffed mole; snake rattles, etc.
Cowdery, Samuel. Specimen of sand-stone from well at Princeton, Ia.

- Crane, Mrs. J. G.* A miscellaneous collection of minerals including native copper, etc.
- Crawford Capt. J. A.* Specimen of hyalite from Hot Springs, Ark.
- Datzell, Jas. M.* Specimen of red pipe stone.
- Davenport, Geo. L.* A stuffed swan and a number of other water fowl.
Modern Indian tomahawk, silver mounted; modern Indian pipe; a number of stone axes, etc.
- Davis & Camp.* Metamorphosed slate from Vermont.
- Downs, Capt.* Specimen of cannel coal containing lead and zinc ores in crystals and seams from mines near California, Mo.
- Eads, L. T.* Specimens of limonite and conglomerate iron ore from the coal measures of Scott county, Iowa.
- Fejervary, N.* Flint arrow-head; stone-axe; stone-ball
- Fisher, J. B.* Polished corals from Iowa City.
- French, Geo. H.* Collection of minerals and ores from Utah and Colorado; hammer-stones from the Island of Rock Island.
- French, Geo. W.* A stone maul; a specimen containing calcite and other crystals; fossil fish from Colorado; skull of a mound-builder.
- French, Morton.* A horned toad from Utah.
- Gilchrist, J. R. ; Mount Pleasant, Iowa.* Copper and jasper.
- Gronen, W. O.* Specimen of sand-stone.
- Hall, Capt. W. P.* Specimen of staghorn sumac, Wisconsin; hammer-stone from mound at Rockingham; a large number of stone and flint implements.
- Hall, Miss Grace.* Modern Indian pipe and stem.
- Harris, Capt. D. S. ; Galena, Ill.* A fine specimen of lead ore and an Indian stone implement.
- Harrison, I. W.* A stone-axe found in Kentucky.
- Hawthorn, B. B. ; Le Claire, Iowa.* A petrefaction.
- Haupt, Adolph.* Forty-five foreign and twenty U. S. postage stamps.
- Hickox, G.* A pair of velvet pants presented to Gen. Tom Thumb by Queen Victoria. A fossil shell and a stone carved by prisoners on the Island during the war.
- Holman, R. B.* A human skeleton mounted.
- Holmes, Mrs. W. H.* A valuable collection of sea shells, arrow-heads, etc.; collection of recent and fossil shells.
- Howard, J. W.* A brown bat.
- Hume, John.* Quartzite from Devil's Lake, Wisconsin.
- Hunting, Rev. S. S.* Thirty specimens of mounted birds from the Mississippi Valley. Specimens of native copper from Lake Superior
- King, Rev. J. D. ; Vinyard Haven, Mass.* (Partly in exchange through Messrs. Tiffany and Pratt;) a valuable collection of decapod crustaceans, sponges, shells, flint implements, etc.
- Kuhnén, Nicholas.* Head of mountain sheep.
- Jones, Miss M. L.* A fossil shell.

- Lane, Mrs. Jas. T.* Large sea shell.
- Lapham, Dr. I. A.; Milwaukee, Wis.* Specimen of lichen.
- Leonard, Prof. N. R., Iowa City.* A fragment of the Meteorite which fell Feb. 12, 1875, near Homestead, Iowa.
- Marder, Luse & Co.; Chicago, Ill.* Paper pulp used for stereotyping.
- Meade, Hon. J. R.; Wichita, Kansas.* Specimens of cinnabar fossils, etc.
- Modeman, M. L. Miss.* Flint scraper from near Lexington, Ky.
- Myers, Monticello, Iowa.* Fossil coral.
- Myers, Dr. R. D.* Carved Indian pipe.
- Nagel, J. J.* A framed collection of 187 foreign and U. S postage stamps.
- Orr, Lewis.* Specimen of encrinal limestone.
- Parry, Dr. C. C.* Collection of small obsidian arrow-heads from near Cedar City, Plate XI, Utah. Section of mountain mahogany (*Cercocarpus*), from Utah.
- Parry, Mrs. C. C.* Specimen of granite used in the Mormon Temple at Salt Lake, Utah.
- Platt, Geo. W., Rock Island.* A box of minerals, ores, etc., from Colorado.
- Plummer, C. G.* Whalebone broom from the South Sea Islands.
- Pratt, Chester.* Silver ornament and arrow-head from Toolesboro, Ia.
- Pratt, Miss Frankie.* A collection of 120 foreign coins, etc.
- Pratt, W. H.* A grooved stone and a hammer stone from the Island. A large collection of the land and fresh water shells of Davenport and vicinity. Ninety-six species.
- Putnam, John C.* Model of a ship.
- Putnam, J. D.* Box of Cretaceous fossils from Canon City, Colorado. A large number of specimens of reptiles, shells, etc., in alcohol, from Davenport, Iowa, Colorado, Wyoming, etc. Stone implement for grinding corn, from Spring Lake, Utah. A large collection of reptiles, molluces, etc., in alcohol, from Utah county, Utah. Six arrow-heads from near St. George, Utah. (Plate XI, fig. 8, 13.) A collection of land and fresh water shells from the Rocky Mountains in Colorado and Wyoming.
- Putnam, W. C.* Small green snake in alcohol.
- Putnam, Mrs. C. E.* A collection of minerals and ores from Colorado. Specimen of silver ore from the Ni-Wot mine, Colorado. Specimen of moss from the summit of Rocky Mountains. Collection of agates. Wire basket made by a blind girl.
- Sanders, Mrs. Alfred.* A collection of botanical specimens from Ohio and Iowa. Six specimens of continental currency. Two historical charts.
- Sands, M.* An East Indian satchel—a relic from the siege of Lucknow.
- Santher, August; Buffalo, Iowa.* Pigment earth, etc.

- Schumacher, Geo.* A group of very large crystals of dog-tooth spar, from Dubuque, Iowa.
- Sears, Daniel.* Copper kettle used by the Indians.
- Sheldon, Prof. D. S.* A collection of plants from Central Illinois. Specimen of amethystine quartz. Foreign marine and land shells (5 genera, 21 species, 89 specimens). Skull of a muskrat and of a flying squirrel. Bones of a gar fish. Two bats, one the Silver-haired.
- Sibels, Miss Isabel, Rapids City.* A sea shell.
- Simpson, Robert.* Iron bake kettle.
- Spink, George.* Skull of rabbit.
- Stibolt, A. T.* Ancient stone axe, fleshing stone, and two flint arrow-heads. Three specimens of fossil coal plants.
- Stuyvesant, Mrs. M. L.* A woven water proof basket from the Sandwich Islands. A Chinese knife, chop sticks and case. A collection of sea-shells, etc. An ancient earthen water jug; from the South Pacific.
- A pair of Chinese slippers. A number of Mexican spurs.
- Thompson, Jas.* Copies from ancient Egyptian paintings.
- Tiffany, A. S.* A stone pipe, and a wheel like relic found in a mound near Buffalo. A considerable number of skulls, bones, flints, axes and other relics from the mounds.
- Tippett, Mrs. C. H., Victory, Wis.* Fossils and agates.
- Wallace, M. B.* Iron shell and ball from Fort Pillow. Specimen of Spanish moss.
- Washington Emery Co.* Specimens of emery, solid.
- Watkins, C. S.* Specimen of brain coral, (*Meandrina*.)
- Weaver, S. W.; Moline, Ill.* An enigmatical stone implement picked up near Moline.
- Welsh, Mr. —; Atkinson, Ill.* A stone axe—broken.
- White, Mr. — of California.* Specimen of Tellurite.
- Wheeler, H.* A collection of flint arrow-heads. A box of minerals.
- Williams, Wm.; Princeton, Iowa.*
- Witherell, L. R.* Piece of petrified log from Buffalo, Iowa.
- Worley, Dr. P. H.* An Indian rattle or drum stick.
- Worth, L. A.* Pentremites.

Donors of Stone and Flint Implements, 1875.

- Adams, Albert—Le Claire, Iowa.
- Adams, Miss Sarah—Rapids City, Ill.
- Allen Samuel.—Rock Island Co., Ill.
- Barler, A. U.—Aledo, Ills.
- Arnold, Wm.—Le Claire, Iowa.

Adams, W.—Hampton, Ills.
Baker, H. W.—Port Byron, Ill.
Barber, Geo. E.—Port Byron, Ill.
Barry, John.—Port Byron, Ill.
Barber, B.—Port Byron, Ill.
Black, Francis.—Hampton, Ill.
Bickle, Lewis.—Le Claire, Iowa.
Beale, J. J.—Rock Island, Ill.
Black, Jas. Y.—Davenport, Iowa.
Blauvelt, L. T.—Davenport, Iowa.
Braden, John.—Rapid City, Ill.
Blinn, Enos.—Port Byron, Ill.
Bowker, —.—Port Byron, Ill.
Brewster, Mrs. W. C.—Davenport, Iowa.
Brooks, M.—Hampton, Ill.
Brown, Armond.—Port Byron, Ill.
Burnell, Lafayette.—Homer, Minn.
Burrows, Mrs. J. M. D.—Davenport, Iowa.
Boyd, R. M.—Davenport, Iowa.
Collamer, Neil.—Davenport, Iowa.
Campbell, J. T.—Davenport, Iowa.
Candee, Fred.—Moline, Ill.
Carmichael, W. C.—Davenport, Iowa.
Chamberlain, Levi.—Le Claire, Iowa.
Chamberlain, Willie.—Princeton, Iowa.
Cole, Leonard.—Illinois City, Ills.
Cole, Thomas.—Illinois City, Ills.
Colip, W. R.—Toolesboro, Iowa.
Crane, Mrs.—Davenport, Iowa.
Collins, Miss Susan.—Moline, Ills.
Condrow, Chas.—Le Claire, Iowa.
Connelly, John.—Rockingham, Iowa.
Cook, Horace.—Hampton, Iowa.
Corey, J. L.—Davenport, Iowa.
Cox, Jesse.—Rapid City, Ills.
Churchill, Wm.—Rapid City, Ills.
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Davis, Mrs. John.—Rapid City, Iowa.
Decker, Miss Jennie.—Valley City, Iowa.
DeVinney, Calvin.—Hampton, Ill.
Drury, A. C.—Copper Creek, Ills.
Drury, D. C.—Copper Creek, Ills.
Ellis, Mrs. A.—Port Byron, Ill.
Ely, Frank.—Davenport, Iowa.
Emela, Peter.—Cleveland, Ill.
Frazell, M. A.—Oquawka, Ill.

Frazell, J. Hiram.—Oquawka, Ills.
 Fejervary, N.—Davenport, Iowa.
 Fleming, James.—Davenport, Iowa.
 Franks, James B.—Port Byron, Ill.
 Freeland, Misses E. and M.—Rapids City, Ill.
 Funk, H. H.—Muscatine, Iowa.
 Freeland, Felix.—Rapids City, Ill.
 French, G. H.—Davenport, Iowa.
 French, G. W.—Davenport, Iowa.
 Frales, Henry.—Hampton, Ills.
 Gabbert, Capt. W. H.—Davenport, Iowa.
 Gabbert, Frank.—Davenport, Iowa.
 Gass, Rev. J.—Davenport, Iowa.
 Guest, Mrs. R.—Toolesboro, Iowa.
 Graham, Francis.—Rapids City, Ills.
 Gellie, James.—Toolesboro, Iowa.
 Glancy, Richard.—Copper Creek, Ill.
 Gronen, W. O.—Davenport, Iowa.
 Goldsmith, Mrs. H.—Le Claire, Iowa.
 Gray, Wm.—Davenport, Iowa.
 Graves, Chas.—Toolesboro, Iowa.
 Ginung, J.—Rapids City, Ill.
 Goldsmith, Mahala.—Wisconsin.
 Hacker, Adam.—Muscatine, Iowa.
 Hall, Jas. E.—Rapids City.
 *Hall, Capt. W. P.—Davenport, Iowa.
 Hall, G. W.—Rapids City, Ill.
 Hall, Mrs. Mary R.—Davenport, Iowa.
 Harris, Capt. D. S.—Galena, Ills.
 Hollister, Martha L.—Port Byron, Ills.
 Holmes, Mrs. W. H.—Davenport, Iowa.
 Hooke, G. W.—Toolesboro, Iowa.
 Hobbs, W. S.—Toolesboro, Iowa.
 Hanks, Saml.—Le Claire, Iowa.
 Hill, E.—Green River, Ills.
 Hall, Miss Grace R.—Davenport, Iowa.
 Hunting, Mrs. J. M.—Davenport, Iowa.
 Hampton, Mary.—Muscatine, Iowa.
 Harris, Benj.—Le Claire, Iowa.
 Harrison, I. W.—Davenport, Iowa.
 Haviland, Adam.—Pleasant Valley, Iowa.
 Haviland, Benj.—Pleasant Valley, Iowa.
 Henly, H. A.—Pleasant Valley, Iowa.
 Hibbard, Alonzo.—Davenport, Iowa.

*The Academy is indebted to Capt. Hall for a large number of these imple-
 ments presented by himself, and for the collection of hundreds of others from the
 donors, making up fully one-half of the whole collection.

Hilbourn, Jas.—Le Claire, Iowa.
Hindman, Mrs. Ada L.—Toolesboro, Iowa.
Hindman, Danl.—Toolesboro, Iowa.
Hobart, Miss Mary.—Port Byron, Ill.
Hoffman, T. J.—Pleasant Valley, Iowa.
Hostetter, Adam.—Rapids City, Ills.
Hughes, Wm.—Moline, Ill.
Huler, H. S.—Le Claire, Iowa.
Hume, John.—Davenport, Iowa.
Hunting, Rev. S. S.—Davenport, Iowa.
Huntington, Mrs. J. M.—Davenport, Iowa.
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Hall, Albert W.—Davenport, Iowa.
Johnson, Emma.—Davenport, Iowa.
Johnson, Carrie.—Davenport, Iowa.
Keely, Nathan.—Port Byron.
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Krause, Jas.—Port Byron, Ill.
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Lovegood, Geo. W.—Watertown, Ills.
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Lindley, Clarence.—Davenport, Iowa.
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Maguigan, Milton.—Wyalusing, Wis.
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Mills, Richard.—Copper Creek, Ills.
Mills, James.—Copper Creek, Ills.
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Martin, A. E.—Princeton, Iowa.
Martin, Emma.—Pleasant Valley, Iowa.
Maxwell, Charlie.—Princeton, Iowa.
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Modeman, Miss.—Davenport, Iowa.
Moore, Johnnie.—Port Byron, Ill.
Mulholland, John.—LeClaire, Iowa.

Murphy, Oliver.—Toolsboro, Iowa.
Nannah, Henry.—Princeton, Iowa.
Norton, Marietta.—Valley City, Iowa.
O'Brien, James.—Davenport, Iowa.
Parry, Dr. C. C.—Davenport, Iowa.
Parsons, J. J.—Toolesboro, Iowa.
Patterson, Wm.—Toolesboro, Iowa.
Penry, Dr. D. A.—LeClaire, Iowa.
Pope, Justin.—Princeton, Iowa.
Preston, Dr. C. H.—Davenport, Iowa.
Pratt, Chester.—Davenport, Iowa.
Pratt, W. H.—Davenport, Iowa.
Primm, Louis.—LeClaire, Iowa.
Prinning, L.—LeClaire, Iowa.
Putnam, J. D.—Davenport, Iowa.
Putnam, Mrs. C. E.—Davenport, Iowa.
Perry, J.—Wisconsin.
Price & Hornby.—Davenport, Iowa.
Richards, Mrs. O. W.—LeClaire, Iowa.
Roberts, Israel.—Andalusia, Ill.
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Roberts, R. W.—Davenport, Iowa
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Rowe, James.—Port Byron, Ill.
Reynolds, Ira.—Copper Creek, Ills.
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Ryan, Danl.—Davenport, Iowa.
Sands, Michael.—Davenport, Iowa.
Schloeffel, H. A.—Rapids City, Ill.
Schricker, Chris.—Davenport, Iowa.
Schuyler, Mary.—Port Byron, Ill.
Scott, John.—Pleasant Valley, Iowa.
Shirley, Mrs. B.—Le Claire, Iowa.
Shurtleff, J. S.—Rapids City, Iowa.
Sibels, Wm.—Watertown.
Sibels, A. C.—Watertown.
Smull, Henry R.—Copper Creek, Ill.
Snyder, Geo.—Rapids City, Ill.
Shaw, Freeman.—Toolesboro, Iowa.
Sowash, Joshua.—Toolesboro, Iowa.
Staffelbach, J. C.—Rockingham, Iowa.
Stibolt, A. T.—Davenport, Iowa.
Strohbein, Henry.—Le Claire, Iowa.

Suiter, John.—Le Claire, Iowa.
 Sanders, Mrs. Alfred.—Davenport, Iowa.
 Shaw, Wm.—Toolesboro, Iowa.
 Sillick, A.—Toolesboro, Iowa.
 Shannon, James.—Port Byron, Ills.
 Smith, Franklin A.—Copper Creek, Ills.
 Scheiblaye, John.—Port Byron, Ills.
 Suiter, Wm.—Le Claire, Iowa.
 Sumner, T. P.—Henry county, Ills.
 Summers, Laurel.—Le Claire, Iowa.
 Suiter, Philip.—Le Claire, Iowa.
 Swain, Mathias.—Fairport, Iowa.
 Sweet, Albert.—Hopkinton, Mass.
 Thomas, John.—Hampton, Ill.
 Thompson, Jas. H.—Port Byron, Ill.
 Tiffany, A. S.—Davenport, Iowa.
 Tippets, Miss Frances M.—Victory, Wis.
 Tusk, John.—Milan, Ill.
 Upson, P. K.—Watertown, Ills.
 Vanderveer, Geo.—Andalusia, Ill.
 Vogel, John.—Rapids City.
 Vanderveer, Miss Josie.—Andalusia, Ill.
 Warner, Fred.—Le Claire, Iowa.
 Watkins, C. S.—Davenport, Iowa.
 Welch, Mr.—Atkinson, Ill.
 Weaver, S. W.—Moline, Ill.
 Wheeler, H.—Davenport, Iowa.
 Williams, J. W.—Le Claire, Iowa.
 Williams, Saml.—Princeton, Iowa.
 Woodward, D.—Port Byron, Ill.
 Wainwright, Sam'l.—Rapids City, Ills.
 Weaverling, Mrs. Martha.—Andalusia, Ills.
 Willits, Dr. Thomas.—New Boston, Ills.
 Wilkinson, J.—Le Claire, Iowa.
 Young, Mrs.—Le Claire, Iowa.

List of Donations to the Library of the Academy.

1868.

- Barbee, Dr. W. J.; Carrollton, Miss.* Two copies of "The Cotton Question." "Barbee's First Principles of Geology."
Farquharson, Dr. R. J. Autograph letter of Gen. Jackson. Bulletin des Sciences Naturelles, vols. 1 to 25.
Harlan, Hon. James; Washington, D. C. Smithsonian Institution Reports for 1863 and 1866.

- Parry, Dr. C. C.* Proceedings of St. Louis Academy of Science, 1 vol.
Price, Hon. H. Report on Levees of the Mississippi. Smithsonian Report, 1866. Patent Office Report, 1865. Agricultural Report, 1866.
Walsh, Benj. D.; Rock Island. Report on the Noxious Insects of Illinois.

1869.

- Boston Society of Natural History.* Proceedings, Vol. XII.
Clinton, Hon. G. W.; Buffalo, N. Y. List of Plants growing in the vicinity of Buffalo, New York. A large number of Entomological and other pamphlets.
Fejervary, N. Owens Geological Survey of Wisconsin, Minnesota and Iowa.
Hall, James; Albany, N. Y. Twentieth Annual Report of the Regents of New York State University, on the condition of the State Cabinet.
James, B. F.; Washington, D. C. A package of Patent Office Reports.
Jones, P. B. A photograph of Prof. Eastman, of U. S. Naval Observatory.
Little, Prof.—*State Geologist of Mississippi.* Hilgard's Geology and Agriculture of Mississippi.
Parry, Dr. C. C. Report of Surveys Across the Continent.
Portland Society of Natural History; Portland, Maine. Proceedings Vol. I, part II. Journal, Vol. I, part I.
Sheldon, Prof. D. S. Smithsonian Report for 1859.
Smithsonian Institution. Six Annual Reports. Seven volumes of Miscellaneous Collections.
Thompson, James. Several volumes of Coast Surveys.
Worthen, Prof. A. H.; Springfield, Ill. Geological Report of Illinois, Vol. III.
U. S. Naval Observatory; Washington, D. C. Astronomical Observations, 1866.

1870.

- Boston Society of Natural History.* Proceedings, Vol. XIII.
U. S. Naval Observatory; Washington, D. C. Report of Eclipse 1869.

1871.

- Harlan, Hon. James, Washington, D. C.* Hayden's Geological Survey of Colorado and other public documents—8 vols.
White, Prof. C. A.; Iowa City. Geology of Iowa, 1872—2 vols.
Worthen, Prof. A. H.; Springfield, Ill. Geological Survey of Illinois, Vol. IV.
U. S. Naval Observatory. Report of the Eclipse of the Sun, December, 1870.

1872.

- Boston Society of Natural History.* Proceedings, Vol. XIV.
Mansel, Richard; Rock Island. Three pamphlets on a New Theory of the Universe.
U. S. Naval Observatory; Washington. Pamphlets on the "Transit of Venus" and "Encke's Comet."

1873.

- Harlan, Hon. James.* Several volumes of Government Reports.
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CONSTITUTION OF THE DAVENPORT ACADEMY OF NATURAL SCIENCES.

Approved January 28th, 1876, being the substance of the Articles of Incorporation adopted January 9th, 1875.

ARTICLE I.—NAME AND OBJECT.

Section 1. This society shall be known as "The Davenport Academy of Natural Sciences," and shall have for its objects the increase and diffusion of a knowledge of the Natural Sciences, by the establishment of a museum, the reading and publication of original papers and other suitable means.

ARTICLE II.—MEMBERS.

Section 1. This society shall consist of resident, life, honorary and corresponding members, who shall be elected in such manner as the by-laws may prescribe.

Section 2. The right of voting and holding office shall be confined to resident and life members, but honorary and corresponding members shall be entitled to all other privileges.

ARTICLE III.—OFFICERS AND TRUSTEES.

Section 1. The officers of the Academy shall consist of a President, Vice-President, Corresponding Secretary, Recording Secretary, Treasurer, Librarian and Curator.

Section 2. The officers above named with three other members, all of whom must be residents of Scott County, Iowa, shall form a Board of Trustees for the management of the business of the Academy and to conduct its proceedings, and a majority of such members shall constitute a quorum for the transaction of business.

Section 3. The officers and other members of the Board of Trustees shall be elected by ballot at the annual meeting on the first Wednesday of January in each year, and must receive a majority of the votes cast; only one officer or trustee being elected at each balloting. In case of a vacancy caused by the death or resignation of any officer or trustee, an election shall be held to fill the same, at the next meeting after the announcement thereof is made.

ARTICLE IV.—ACQUISITION AND MANAGEMENT OF PROPERTY

Section 1. The Academy may receive, hold, and manage all property, acquired by gift or purchase, necessary or proper to promote its objects.

Section 2. No contract for the purchase of real estate shall be entered into, nor shall any improvements thereon be made, nor shall

such property of the society be sold, except in accordance with the affirmative vote of a majority of the members of the society present at a special or regular business meeting held after due notice given, specifying the object thereof.

ARTICLE V.—BY-LAWS.

Section 1. The Board of Trustees, subject to the approval of the society, shall have power to make all needful By-Laws, Rules and Regulations, for the purpose of carrying out the objects of the society and conducting its affairs, and not inconsistent with the Constitution or Articles of Incorporation.

ARTICLE VI.—JOURNAL OF PROCEEDINGS.

Section 1. A Journal of the Proceedings, By-Laws, Rules and Regulations, and an account of all receipts and disbursements shall be kept by the Secretary and Treasurer for the inspection at all times of the members of the Society.

Section 2. At the annual meeting the Board of Trustees shall make a written report of their proceedings, which report shall embrace a full statement of the business affairs of the Society.

ARTICLE VII.—AMENDMENTS.

Section 1. This Constitution, with the exception of Section 1, Article II, embraces in substance the provisions of the Articles of Incorporation and can only be amended as provided therein.

Section 2. The provisions of the Articles of Incorporation, as provided therein, may be altered or amended at any time by the affirmative vote of a majority of the members of the Society at a special meeting to be called by the Board of Trustees for that purpose, notice of such special meeting stating the object thereof, to be published in some newspaper in the city of Davenport, or personally given to the members thereof, and which amendments must be certified to, acknowledged and recorded as provided by law.

Section 3. The provisions of the Constitution, not embraced in the Articles of Incorporation, may be altered or amended at any regular meeting of the Society by a vote of two-thirds of the members present, but the proposed amendments must have been presented to the Board of Trustees in writing at least one month before the day of meeting. The Board shall present to the Academy any amendment thus offered with a report on the question of its adoption and with such modifications as they may see fit to recommend; but no additions or amendments to the Constitution inconsistent with the Articles of Incorporation shall be made except as herein before provided for amendments thereto.

BY-LAWS,

**As Revised and Adopted September 25th, 1874, with
Amendments to date of Publication.**

ARTICLE I.—DUTIES OF OFFICERS.

Section 1. The President, or in his absence or inability to serve, the Vice President, shall preside over the meetings of the Academy and Board of Trustees; shall nominate all committees other than those specially excepted; and call such special meetings as he may deem necessary, or as he may be requested to call by the members. He shall at the annual meetings, make a report on the condition and progress of the Academy in all its departments

Section 2. The Corresponding Secretary shall conduct and preserve the correspondence of the Academy; keep correct copies of all letters written on the business of the Academy; acknowledge the receipt of all donations from persons who are not regular members of the Academy; notify all corresponding and honorary members of their election, and keep a correct list of all such members with the date of their election and resignation or death.

Section 3. The Recording Secretary shall take and preserve correct minutes of the proceedings of the Academy and Board of Trustees in books to be kept for that purpose; shall have charge of all records belonging to the Academy; shall notify Regular members of their election and committees of their appointment; shall keep a correct list of the members of the Academy, with the date of their election and resignation or death; and shall notify Regular members of all meetings, and Officers of all matters which shall occur at any meeting requiring their action.

Section 4. The Treasurer shall attend to all receipts and disbursements of the Academy, giving such bonds as the Board of Trustees may require, and shall make a general report to be laid before the Academy at the Annual meeting, and at other times when called for by the Board, including a list of the members entitled to vote; shall pay all accounts against the Academy when the same shall have been approved by a vote of the Board, and furnish proper vouchers for such payments.

Section 5. The Librarian shall take charge of all books belonging to, or deposited with the Academy; keep a catalogue of the Library, in which the names of the donors shall be inscribed, with the dates of reception; and he shall observe and enforce such regulations as the Board shall from time to time make for the use of the books.

Section 6. The Curator shall have charge of the Museum and scientific collections of the Academy, assisted by such committees as

may be appointed by the Academy. He shall superintend the exchange of duplicates, keep a record of all donations made to the Museum, and report all additions at the annual meeting.

Section 7. The officers shall be elected by ballot at the annual meeting, and must receive a majority of the votes cast, only one officer being elected at each balloting.

Section 8. In case of vacancy caused by the death or resignation of any officer, the fact shall be announced to the Academy by the President, and an election to fill the vacancy shall be had at the next meeting after such announcement shall have been made.

Section 9. The Board of Trustees shall control all expenditures of money, make rules for the use of the Library and Museum, and special rules for the direction of the Librarian and Curator, and shall have full power to act for the interests of the Society in any way not inconsistent with the Constitution and By-Laws.

ARTICLE II.—MEMBERS

Section 1. Regular members shall be elected in the manner hereinafter prescribed, and shall pay an initiation fee of five dollars (\$5.00).

Section 2. Any Regular member may at any time after his election become a Life member by paying into the Treasury of the Academy the sum of fifty dollars (\$50.00), and notifying the Recording Secretary that he desires to be enrolled as a Life member.

Section 3. The business of the Academy shall be exclusively managed by, and its officers selected from the Regular and Life members.

Section 4. Any persons who may be interested in the study of Natural Science, or desirous of promoting the interests of the Academy may be elected as Corresponding members, and shall have all the privileges of Regular members except those of voting and holding office.

Section 5. Corresponding members may become Regular members by notifying the Recording Secretary that such is their desire, and paying the initiation fee.

Section 6. Honory members shall be selected from persons eminent for their attainments in science on whom the Society may wish to confer a compliment of respect, and shall have all the privileges of Regular members except those of voting and holding office. They shall not exceed forty (40) in number, twenty of whom shall be residents and citizens of the United States, and twenty of foreign countries.

Section 7. Candidates for Regular membership must be proposed and vouched for in writing by two members, (who shall be required to have some personal acquaintance with the person they propose,) at a regular meeting of the Academy, and be balloted for at the next regular meeting.

Corresponding members shall be elected in the same way as Regular members, and the number of those classes is unlimited.

Honorary members shall only be elected at the annual meeting.

All members shall be elected by single ballot, and must receive the affirmative votes of at least four-fifths of the members present.

Any rejected candidate shall not be eligible for membership within one year after such rejection.

Any member in good standing may withdraw from the Academy by giving written notice of his intention so to do, and paying all arrearages due from him.

Any member who shall neglect to pay his dues within one year after they become due, shall, upon being notified by the Treasurer and not paying within one month thereafter, forfeit membership.

Members may be expelled from the Academy for cause, and after a due hearing, by a vote of not less than two-thirds of the members present at any regular meeting.

ARTICLE III.—ASSESSMENTS.

Section 1. Every Regular member elect shall pay to the Treasurer an initiation fee of five dollars (\$5.00).

Section 2. Every Regular member shall be subject to a semi-annual assessment of one dollar (\$1.00), payable to the Treasurer in June and December.

Section 3. The Board of Trustees may exempt a member from assessment when, from peculiar circumstances, they shall deem it for the interests of the Academy to do so.

ARTICLE IV.—COMMITTEES.

Section 1. Standing committees shall be appointed on the Museum, on the Library and on Publications, at the annual meeting by the President.

Section 2. All committees must report in writing, and every report must be signed by a majority of the committee offering it.

Section 3. All committees must report at the regular meeting next succeeding their appointment.

Section 4. The committee on Publication shall consist of five members, and shall from time to time cause to be published and superintend the publication of such papers read before the Society and such portions of the records of the proceedings as may seem to them calculated to promote the interests of Science, so far as the funds appropriated by the Board will permit.

Section 5. The Museum committee shall consist of one member for each department of the Museum, who shall assist the Curator in taking charge of and arranging all donations and deposits in their several departments, and shall carefully label each article.

Section 6. The Library committee shall consist of three members, who shall have charge of all books belonging to, or deposited with the Academy, and shall have power to make such exchanges of duplicates as may appear desirable.

ARTICLE V.—MUSEUM AND LIBRARY.

Section 1. Members of all classes, and the public generally, shall have access to the Museum at such times as the Board shall determine.

Section 2. No specimens shall be removed from the Museum without leave of the Curator and committee of the department to which they belong, who shall take a receipt for the same and be responsible for their return in good order.

Section 3. The rules and regulations for the use of the Library, shall be printed and exposed in the Library rooms

ARTICLE VI.—MEETINGS.

Section 1. The Annual meeting shall be held on the first Wednesday in January, at which time the election of officers for the ensuing year shall take place, and the reports of the retiring officers shall be heard.

Section 2. The regular meetings of the Academy shall be held on the last Friday of each month.

Section 3. Special meetings may be called by the President whenever he may deem it necessary; or at the request of any three members in writing. Field meetings and excursions may be held at such time and place as the Academy may direct.

Section 4. The Board shall meet one-half hour before each regular meeting; and at other times at the call of the President, or any two members of the Board.

Section 5. Six members shall constitute a quorum for the transaction of business.

Section 6. The Order of Business at Regular meetings shall be as follows:

- 1st. Reading the minutes of last meeting.
- 2d. Reports of committees.
- 3d. Report of Corresponding Secretary.
- 4th. Donations to the Museum and Library.
- 5th. Deferred business,—election of members, etc.
- 6th. New business,—proposals for membership, etc.
- 7th. Written communications.
- 8th. Verbal communications.
- 9th. Adjournment.

ARTICLE VII.—SPECIAL PROVISIONS

Section 1. In such points of order as are not noticed in these By-Laws, the Academy shall be governed by the established usages of similar institutions.

Section 2. In case of the dissolution of the Academy, a meeting of the Regular members shall be called to decide on the disposition which shall be made of its property.

Section 3. No compensation shall be paid to any person whatever, and no expenses incurred unless authorized by the Board of Trustees

Section 4. The By-Laws of the Academy may be altered or amended at any regular meeting by a two-thirds vote: provided that the proposition for such amendment shall have been presented at a previous regular meeting.

ARTICLE VIII.—SECTIONS.

Adopted May 12th, 1876.

Section 1. Sections of the Academy holding separate meetings, may be formed on the written application of five members, by consent of the Trustees.

Section 2. The requirements of membership shall be,

1st. Membership in the general Academy.

2d. Written nomination by two members at a regular meeting of the Section.

3d. Election by a three-fourths vote of the members present at the subsequent meeting

Section 3. Notice of such proceedings as may be deemed of sufficient interest shall be given by the Secretary at the next regular meeting of the Academy.

Section 4. Sections shall have the exclusive right to make additional regulations for perfecting their organization, subject to the approval of the Trustees

ARTICLE IX.—LIBRARY REGULATIONS.

Adopted May 12th, 1876.

Section 1. None but members of the Academy shall be entitled to the use of the Library; but the Librarian may, at his discretion, permit persons not members to consult books at the rooms of the Association.

Section 2. Books on deposit shall not be taken from the Academy rooms without consent of the owner, and periodical publications shall remain on the tables for two weeks after their reception

Section 3. When a book is drawn, the Librarian, or in case of Trustees, the drawer shall record in a book kept for the purpose, the title of the volume, name of drawer and date of drawing, and on its return, the date of return.

Section 4. Books shall not be kept out longer than one calendar month at a time, and may be called in sooner by the Librarian.

Section 5. No person shall retain more than five volumes at any one time, and books returned shall not be redrawn by the same person before three days after their return.

Section 6. Holders of books keeping them out longer than one month at a time, or three days after notification to return by the Librarian, shall be liable to a fine of five cents per diem for each volume so retained.

Section 7. If a book shall be lost, destroyed or injured further than by reasonable wear, the drawer shall be liable for damages to the volume or set, as assessed by the Board of Trustees.

Section 8. The Library shall be open for drawing each Saturday from two to three o'clock p. m., and at other times when the Librarian or a deputy may be present.

ARTICLE X.—ENDOWMENT FUND.

Adopted June 5th, 1876

Section 1. There shall be established a fund to be known and designated the Endowment Fund, and all money paid into the Treasury for Life Memberships and all money received from any other source, and set apart for that special purpose, shall be reserved for investment in real estate for a home for the Academy.

Section 2. In no way shall the money so set apart be diverted to any other purpose.

Section 3. The money so paid into the Treasury from time to time shall be invested by the Finance Committee under the direction of the Board of Trustees.

LIST OF REGULAR MEMBERS,
With date of Election.

*Allen, Col. Wm.....	October,	1873
Allen, Mrs. Wm.....	July,	1875
Babcock, E. J	May,	1876
Baker, Dr. R. F.....	January,	1869
Baker, Mrs. J. F.....	October,	1875
Balch, F. A.....	May,	1875
Ballou, E. S.....	February,	1875
Ballou, Geo. H.....		1875
Ballou, Mrs. G. H.....	July,	1875
*Barler, A. U.....	December,	1867
Barrette, Miss Lydia O.....	July,	1875
Barris, Rev. W. H.....	December,	1867
Berryhill, Col. J. H.....	October,	1874
Bills, J. C.....	April,	1875
Bills, Mrs. J. C	December,	1875
Bowman, J. R.....	October,	1874
Brewster, W. C	April,	1873
Brewster, Mrs. W. C.....	September,	1875
Brown, L. B.....	June,	1875
Brown, Manily T.....	November,	1875
Bryant, Seth P.....	October,	1868
Bryant, Mrs. S. P	September,	1875
Burr, C. P.....	May,	1873
Carmichael, J. E.....	March,	1876
Carstens, Gustav.....	May,	1876
Chapin, E. H.....	February,	1876
Chapin, Mrs. E. H.....	February,	1876
Cochran, Dr. M. B.....	March,	1869
Cochran, Mrs. M. B.....	June,	1875
Cook, Wm.....	June,	1876
Cook, Mrs. E.....	January,	1876
Crandall, J. A.....	February,	1876
Crawford, Jos. A.....	May,	1874
Crawford, Mrs. J. A.....	July,	1875
Crosby, W. E.....	January,	1871
Curry, Mrs. T. F. M.....	May,	1876
Dalzell, Henry.....	July,	1875
Davies, L. S.....	February,	1874
*Davies, Jno. L.....	January,	1868

*Deceased.

Davies, Mrs. Jno. L.....	August, 1875
Day, E. A.....	February, 1868
DeArmond, Jas. M.....	March, 1873
*Dermody, Thos.....	January, 1868
Eads, L. T.....	December, 1867
Eldridge, C. H.....	April, 1868
Farquharson, Dr R. J.....	December, 1868
Fisher, Mrs. M.....	January, 1876
Fisher, J. B.....	May, 1875
Fitch, Geo. W.....	November, 1875
Fitch, Mrs. G. W.....	March, 1876
French, Dr. L.....	December, 1868
French, Geo. H.....	August, 1868
French, Mrs. G. H.....	July, 1875
French, Geo. W.....	July, 1875
Fulton, H. C.....	December, 1875
Gass, Rev. J.....	May, 1875
Gifford, Ira M.....	February, 1868
Gifford, Mrs. Ira M.....	July, 1875
Gilman, S. F.....	January, 1875
Gould, Miss Ellen.....	September, 1875
Grant, Mrs. Jas.....	September, 1875
Griggs, F. H.....	July, 1875
Hall, Capt. W. P.....	May, 1875
Hancock, F. W.....	May, 1875
Harrison, Chas. E.....	October, 1875
Hazen, Dr. E. H.....	October, 1868
Hazen, Mrs. E. H.....	June, 1875
Haupt, J. G.....	November, 1874
Holmes, Miss Clara.....	September, 1875
Holmes, W. H.....	February, 1868
Hopkins, E. T.....	January, 1876
Howard, Mrs. Col.....	September, 1875
Hume, John.....	January, 1868
Hume, Mrs. J.....	June, 1875
Hunting, Rev. S. S.....	May, 1874
Hunting, Mrs. S. S.....	June, 1875
Huntington, Mrs. H. B.....	August, 1875
Humphrey, J. J.....	November, 1875
Iles, Dr. T. J.....	January, 1868
Jervis, F. I.....	February, 1876
Jervis, Mrs. F. I.....	February, 1876
Kirk, Franklin.....	October, 1874
Lane, Mrs. J. T.....	June, 1875
Leonard, Miss Bessie.....	September, 1875
Le Claire, Jos. A.....	July, 1875

*Deceased.

Lesslie, Chas. C.....	January, 1875
Lindley, Clarence.....	May, 1875
Lynch, E. P.....	December, 1868
Mandeville, Mrs. Col. H. M.....	June, 1876
Martin, Capt. R. R.....	September, 1876
Martin, Mrs. H. M.....	October, 1875
Marsh, Mrs. H. C.....	May, 1876
Mason, Jas. B.....	February, 1875
McGonegal, Mrs. M. A.....	November, 1875
Middleton, Dr. W. D.....	February, 1874
Middleton, Miss Mary.....	October, 1875
Millar, Rohlfe S.....	April, 1875
Millar, Mrs. S. B. R.....	June, 1875
Myers, Dr. R. D.....	February, 1868
Nagel, J. J.....	October, 1874
Newcomb, Mrs. D. T.....	October, 1875
*Parker, Jonathan.....	February, 1875
Parker, Geo. H.....	February, 1876
Parry, Dr. C. C.....	December, 1867
Parry, Mrs. C. C.....	June, 1875
Phelps, J. B.....	March, 1875
Phelps, Mrs. J. B.....	December, 1875
Plummer, Chas. G.....	February, 1868
Potter, Waldo M.....	March, 1874
Potter, Mrs. W. M.....	July, 1875
Pratt, W. H.....	December, 1867
Pratt, Miss Lucy.....	June, 1875
Pratt, Miss Frankie.....	January, 1876
Pratt, Chester L.....	January, 1876
Preston, Dr. C. H.....	October, 1873
Putnam, C. E.....	July, 1869
Putnam, Mrs. C. E.....	June, 1869
†Putnam, J. Duncan.....	June, 1869
Putnam, H. St. Clair.....	November, 1875
Putnam, Jno. C.....	November, 1875
Putnam, W. C.....	May, 1876
Putnam, Miss E. D.....	October, 1875
Raff, Miss Mary.....	October, 1875
Riepe, Wm.....	December, 1867
Renwick, Jas.....	February, 1868
Renwick, Wm.....	March, 1868
Renwick, Mrs. Wm.....	July, 1875
Renwick, Miss Margaret.....	September, 1875
Renwick, Miss Rebecca.....	September, 1875
Richardson, D. N.....	February, 1876

*Deceased.

†Life member.

Richardson, Mrs. D. N.	February, 1876
*Roberts, R. W.	April, 1873
Roberts, U. N.	October, 1873
Rogers, Miss Harriet.	July, 1875
Rohlf, M. J.	March, 1876
Rose, Roderick.	September, 1875
Ross, Wm. F.	March, 1869
Rowe, John.	November, 1875
Runge, Henry.	August, 1875
Russell, Edward.	October, 1868
Russell, Mrs. E.	February, 1876
Smith Otto,	Feb. 1868
Sanders, Mrs. M. A.	October, 1875
Sands, M.	November, 1874
Sheldon, Prof. D. S.	December, 1867
Sheldon, Mrs. D. S.	June, 1875
Sherman, Mrs. W. B.	February, 1876
Sickels, Mrs. Robt.	October, 1875
Smetham, Richard.	February, 1876
Skinner, W. J.	
Skinner, Mrs. W. J.	November, 1875
Spink, Geo. H.	June, 1875
Spink, Henry.	December, 1874
Stibolt, J. P.	February, 1876
Stibolt, Mrs. J. P.	February, 1876
Stibolt, Albert.	September, 1873
Stuyvesant, M. L.	November, 1875
Stuyvesant, Mrs. M. L.	November, 1875
Sudlow, Miss P. W.	October, 1875
Temple, John.	February, 1873
Thompson, James.	March, 1868
Thompson, James.	November, 1875
Thompson, Thos.	November, 1875
Tiffany, A. S.	December, 1867
*True, D. S.	December, 1867
Twomey, D. H.	January, 1876
Wadsworth, Mrs. W. C.	June, 1875
Watkins, C. S.	February, 1868
Wells, R. H.	November, 1875
Wing, Geo.	February, 1876
Worley, Dr. P. H.	March, 1876
Wheeler, H.	February, 1868

*Deceased.

List of Corresponding Members.

Allen, Miss Lizzy.....	Davenport, Iowa.	1869
Ayers, Edwin.....	Champaign, Ill.	
Ayers, Miss Mary O.....	Champaign, Ill.	
Barbee, Dr. Wm. J.....	Carrolton, Miss.	
Barler, Prof. O. L.....	Upper Alton, Ill.	
Baylies, Rev. Henry.....		
Bolander, H. N.....	San Francisco, Cal.	1869
Burnell, Levi.....	Milwaukee, Wis.	
Byers, Wm. N.....	Denver, Col.	1869
Clinton, Hon. G. W.....	Buffalo, N. Y.	1869
Crapnell, W.....	New Boston, Ill.	
Dial, Joshua.....	Senatobia, Miss.	
Dickey, Samuel H.....	Fulton, Ill.	
Eads, A. D.....	Champaign, Ill.	
Eads, Rev. R. S.....	Bolton, Mass.	
Faught, V. R.....	Hamilton, Ill.	
Griffith, Lieut. J. E.....	U. S. Lake Survey, Detroit, Mich.	
Haines, Mrs. Mary P.....	Richmond, Ill.	1873
Hall, M. S.....	Wilmington, Ill.	
Higday, Dr. T.....	La Porte, Ind.	
Hinrichs, Prof. G.....	Iowa City, Iowa.	
*Hiskey, W. O.....	Minneapolis, Minn.	
*Kennicott, Dr. Robert.....	Chicago, Ill.	
*Lapham, Dr. I. A.....	Milwaukee, Wis.	
May, Enoch.....	Burlington, Iowa.	
Muench, Hon. Fr.....	Missouri.	
Nissen, Theo.....	Rock Island, Ill.	
Newbury, Prof. J. S.....	Columbia College, New York.	
Parker, Prof. H. W.....	Grinnell, Iowa.	
Parker, N. H.....	St. Louis, Mo.	
Riley, Chas. V.....	St. Louis, Mo.	
*Rodman, Gen. T. J.....	Rock Island, Ill.	
Roe, Dr.....	Bloomington, Ill.	
Stewart, J. R.....	Toledo, Iowa.	
Tanner, Frank B.....	Dubuque, Iowa.	
*Torrey, Dr. John.....	New York, N. Y.	1869
*Walsh, Benj. D.....	Rock Island, Ill.	
White, Dr. Chas. A.....		
Wilcox, Dr. H. B.....	Three Oaks, Mich.	
Wislizenus, Dr. A.....	St. Louis, Mo.	1869
Worthen, A. H.....	Springfield, Ill.	

*Deceased.

[The following paper was received too late for insertion in its proper place.]

A LIST OF ORTHOPTERA,

Collected by J. Duncan Putnam, of Davenport, Iowa,
during the Summers of 1872-3-4 & 5, chiefly in
Colorado, Utah and Wyoming Territories.

BY DR. CYRUS THOMAS.

This collection, which has evidently been made with much care, is one of the most valuable ever made in the West. As will be seen by reference to the following notes, not only has it added much to our knowledge of the range of several species, but has also brought to light some new species. I have added the species from Iowa found in the collection as this will hereafter aid in preparing catalogues for that State, when a State Entomologist is appointed, which we hope may be the case ere long.

MANTIDÆ.

I find but two specimens of this family in the collection.

1. *Stagmomantis dimidiata*, Burm.

A single female well preserved, showing clearly the characteristics which distinguish this species from the closely allied *S. Carolina*, Linn, with which it is often confounded. Canon City, Colorado.

2. *Stagmomantis* ——— ?

Too badly mutilated to be determined; probably new. It has somewhat the appearance of *S. minor* Scudd, but is evidently distinct. Spring Lake, Utah.

BLATTIDÆ.

1. *Ischnoptera pennsylvanica*, DeGeer.

Syn. *Blatta pennsylvanica*, DeG. 1773, Mem. Tom. III, No. 2, pl. 44.

Ischnoptera morio, Burm. Hanb. II, 500.

" *Couloniana*, Sauss. Rev. et Mag., de Zool. 1862, p. 169.

Platamodes pennsylvanica, Scudd., Bost. Jour. Nat. Hist., VII, 417. (1862.)

Taken in Iowa, May.

These specimens are rather larger and darker than those taken in Southern Illinois.

2. *Ischnoptera unicolor*, Scudd.

Syn. *Platamodes unicolor*. Scudd. Bost. Jour. Nat. Hist., VII (1862). 417.

Ectobia lithophila. Scudd. Bost. Jour. Nat. Hist. VII. 418.

Ischnoptera Uhleriana. Sauss. Rev. et, Mag. de Zool. 1862. 169.

Taken in Iowa, July.

3. *Ischnoptera bivittata*, Sp. nov.

Small and slender, lateral margins nearly parallel. Antennæ longer than the body, but not twice its length; basal joints yellow, the basal portion bright brown above and externally, and pale beneath, fading toward the apex; slightly and minutely hairy toward the tip. Face yellow, the space in front between the eyes (fastigium) a shining dark brown; occiput dull-yellow; eyes ashen-blue. Ocelli absent, or if present very minute, as I failed to find them with a moderately strong glass. Pronotum transverse, width to the length about as 5 to 4; width of the front margin to that of the hind margin as 3 to 5, former truncate, latter slightly rounded; a broad, shallow, oblique depression on each side; testaceous, except two rather broad, shining black stripes, one each side of the middle, leaving a median testaceous stripe of about equal width between them, and extending from near the front to, or nearly to, the hind margin. The elytra pale-testaceous or transparent honey-yellow, uniform in color, rather narrow, sides nearly parallel; extend just to the tip of the abdomen; apex somewhat sharply rounded; nerves of the middle field comparatively few, and less branched than in *I. unicolor*. Sub-anal plate distinctly notched at the apex. Legs pale, whitish; abdomen pale testaceous-brown or yellowish brown. Cercel fusiform, large. Length 13 mill.

San Francisco, California. Two specimens—males.

4. *Periplaneta orientalis*, Linn.

Syn. *Blatta orientalis*. Linn. 1845, Fauna, Suec. N. 862.

culinaris. DeG. Ins. III, 344.

Periplaneta orientalis. Burm. Handb. II, 504.

Kakkerlac orientalis. Serv. Hist. Orth. 72.

Stylopyga orientalis. Fisch. de W. Orth. Ross, 70.

Iowa. One female.

The collection contains other specimens of this family, but as they are immature I have not attempted to determine them, though most I am inclined to think, belong to *Ischnoptera pennsylvanica*.

ACRIDIDÆ.

The greater portion of the collection consists of specimens of this family, among which I find a few new species.

1. *Opomala* — ?

A specimen from Mt. Nebo, Utah. August; A larva.

This is probably the larva of *O. neo-mexicana* Thos; I found similar

larvæ on Bear River bottoms in Cache Valley, Utah, but as is the case with this specimen, they were too immature to determine.

This species, according to Stål's arrangement, will fall into his genus *Mermiria*. In my communication to the Philadelphia Acad. Nat. Sci. in 1870, containing the original description of this species, by a slip of the pen or typographical error, the generic name was given as *Opomola*, but was afterwards corrected in my Synopsis, yet Mr. Scudder in a late Bulletin issued by Dr. Hayden, insists on calling attention to this error, although my Synopsis was before him.

2. *Oxycoryphus occipitalis*, Thos.

Syn. *Stenobothrus occipitalis*. Thos. Syn. Acrid. N. Am. 81.

Two specimens from Wind River, Wyoming; others from Boulder, Colorado.

Dr. Brunner Wattenwyl, to whom I forwarded specimens of this species, informs me by letter that it belongs to *Oxycoryphus*.

3. *Stenobothrus coloradus*, Thos.

One specimen from Wind River, Wyoming. July.

This species will have to be separated from this genus as it varies considerably from the typical form. It approaches *Syrbula*, but differs from the character of that genus as given by Stål in having the posterior lobe of the pronotum smooth and not rugulose.

4. *Stenobothrus curtispennis*, Harr.

Syn. *Locusta curtispennis*. Harr. Cat. Ins. Mass. 56.

Chloecallis curtispennis. Harr. Rep., 3d ed. 184.

Stenobothrus longispennis. Scudd. Bost. Jour. Nat. Hist. 1862, Vol. VII. 457.

The collection contains a number of specimens of the short winged variety, chiefly from Middle Park, Colorado; a few specimens were also obtained at Spring Lake, Utah, and other points in the same Territory.

5. *Stenobothrus carpenterii*, Thos.

Syn. *Gomphocerus carpenterii*. Thos. Bul. No. 2. U. S. Geol. Surv. Terr. 1874. 65.

There are several specimens of this species in the collection taken in Colorado, a portion of which are marked "Alpine" and a portion "Sub-Alpine."

An examination of these specimens shows that the gibbosity of the pronotum is absent in the females and often scarcely apparent in the males. As it has all the characters of *Stenobothrus* except the abrupt expansion of the tip of the antennæ I have transferred it to that genus.

* [Those marked "Alpine" are from above timber-line, or over 11,500 feet above the sea; "Sub-Alpine," from below that point but above the level of the "parks" which are about 8,000 feet in elevation. J. D. P.]

6. *Psoloessa? coloradensis*. Sp. nov.

Female.—Vertex rather narrow between the eyes, with less than the shortest diameter of the eyes; fastigium but slightly declivant, margins slightly, though distinctly, elevated and meeting in front in a right angle; a very slender median carina usually visible; lateral foveola rather large, distinct, quadrate, slightly elongate, placed quite obliquely on the sides of the fastigium and approximating in front; frontal costa slightly sulcate. Pronotum short, about the same length as the head, slightly constricted in the middle; lateral carinae strongly approximating each other a little in advance of the middle, from which they diverge considerably in front and more posteriorly; the posterior extremity obtuse-angled and slightly rounded at the tip; the transverse sulcus which is situated about the middle, is very minute but distinct and cuts all three of the thread-like carinae. Elytra about equal in length to the abdomen; narrow, and chief longitudinal nerves quite prominent. Prosternum not armed with a spine, (which Mr. Scudder omits to state when giving the generic characters.) General color pale, fuscous-brown, with an ashen hue on the front portions and posterior legs; face more or less brownish, the margins of the frontal costa usually sprinkled with black dots. The middle portion of the dorsum of the pronotum occupied by a somewhat broad, pale stripe, in some specimens indistinct, in others quite distinct and occupying all of the inter-carinal space of the anterior lobe; lateral carinae pale yellow, upper portion purplish, margined above next the carina by a slender black line, a pale irregular, somewhat gibbous or raised stripe running from the middle of the front margin to the posterior end of the lateral carina, middle space purplish with an oblique yellow stripe margined with black in the posterior part, lower margin pale. Elytra brown with several black subquadrate spots along the middle field; a few dark-brown dots are usually scattered along the marginal area and sometimes on the sutural area. Wings pellucid. The disk of the posterior femora more or less flecked with dark brown; three brown spots on the upper edge, the middle one largest.

Male.—Much smaller than the female; vertex narrower, frontal costa not always sulcate; and sometimes not acuminate above; markings on the side of the pronotum somewhat variable, sometimes pale with an irregular brown stripe in the middle; spots on the elytra fewer in number and small. The sub-anal plate conical. Antennae rather broad toward the apex, and flattened. Dimensions: ♀. Length, 0.80 inch; elytra, 0.55 in.; posterior femora, 0.38 in. ♂. Length to tip of elytra, 0.59 in.; elytra, 0.37 in. Eight ♀ and five ♂ taken at Denver, Colorado in June.

I am not certain that this species belongs in this genus.

7. *Tragocephala pacifica*, Thos.

Syn. *Tragocephala pacifica*. Thos. Syn. Acrid. N. Am. 161

One specimen, ♂, taken at Empire, Col. July.

Mr. Scudder (Proc. Bost. Soc. Nat. Hist. Vol. XVII, 1874-5), contends that this species is clearly distinct from *T. infuscula*. Harr.

The specimen before me corresponds in every particular with the characters of the male of *T. pacifica* which he gives as distinguishing it from *T. infuscula*. A comparison with specimens of the latter from this section satisfies me that he is correct in his conclusions. I have before me some specimens collected by Prof. Riley in Missouri, among

which I find one with an anomalous pronotum. The posterior lobe is strongly gibbous, the entire surface being elevated rather above the usual height of the crest and rounded.

8. *Tragocephala viridifasciata*, Harr.

One female each, of the green and fuscous varieties taken in Iowa, May 10th.

9. *Camnula*? *pellucida*, Scudd.

Syn. *Ædipoda pellucida*. Scudd. Bost. Jour. Nat. Hist. VII, 472.
atrox. Scudd. Haydens. Geol. Surv. Neb., 258.

Camnula tricarinata. Stål. Recens. Orth., 120.

There are several specimens, males and females, in the collection taken at Empire, Middle Park, Boulder and other sub-alpine points in Colorado, varying in elevation from seven to ten thousand feet above the level of the sea. The specimens from the Rocky Mountain regions do not differ perceptibly from either *pellucida* or *atrox*, which I am satisfied are not specifically distinct. The description of *C. tricarinata*, as given by Stål does not exactly agree with the characters of Mr. Scudder's species, yet I am inclined to think it is not distinct. My doubts apply more to the generic than the specific characters.

I think it is now pretty well settled that *atrox* is not the destructive migratory species of California.

10. *Tomonotus tenebrosus*, Scudd.

Syn. *Ædipoda tenebrosa*. Scudd. Hayden's Geol. Surv. Neb., 251.

Tomonotus pseudo-neietanus. Thos. Proc. Acad. Nat. Sci. Phila. 1870, 80.

tenebrosus. Thos. Syn. Acrid. N. Am. 107.

Arphia sanguinaria? Stål. Recen. Orth. 119.

tenebrosa Scudd. Bul. U. S. Geol. Surv. 1876.

simplex? Scudd. Proc. Bost. Soc. Nat. Hist., XVII, 1874-5.

conspersa? Scudd. Proc. Bost. Soc. Nat. Hist., XVII, 1874-5.

luteola? Scudd. Proc. Bost. Soc. Nat. Hist. XVII, 1874-5.

Several specimens, chiefly females, taken in August at Spring Lake, Utah.

This species varies considerably in coloration, the males in some instances being almost black, while others are quite dark with a pale marginal stripe on the disk of the pronotum, sometimes the disk is pale throughout; the females vary in general color from brown to pale ashen-brown sprinkled over with black dots, the disk of the pronotum being marked with longitudinal fuscous dashes.

The *sanguinaria* of Stål may be distinct, but I am strongly inclined to the opinion that it is identical with *tenebrosus*.

I can see no proper use for the new genus *Arphia* established by this author and therefore retain Saussure's genus *Tomonotus* as I have characterized in my Synopsis. The chief distinguishing features are the form of the frontal crest, and the tricarinate (or visculcate) frontal costa above the ocellus.

I have not seen the types of Scudder's *A. simplex*, *consersa*, *luteola* and *frigida*, but believe the first three are but varieties of this variable species. *A. frigida* is probably distinct. This author, in my opinion relies too much on color and markings in determining species of *Aceridii*. While it is true the markings and color are very uniform in some species, as *Æ. carolina*, yet in others there is considerable variation; for example *Æ. undulata*, a well marked species, the wings are sometimes almost entirely pellucid, in others there is a tolerably distinct fuscous band; and even in the genus now under consideration, his two species *T. xanthopterus* and *T. carinatus* are certainly varieties of *T. sulphureus*, and Dr. Brunner Wattenwyl is disposed to consider *tenebrosus* also a variety.

11. *Arphia neglecta*, Thos.

Syn. *Edipoda neglecta* Thos. Proc. Acad. Nat. Sci., Phila. 1870. 276.

Arphia neglecta. Scudd. Bul. U. S. Geol. Surv. Terr. 1876.

One male taken at Empire, Colorado. July.

Mr. Scudder places this species provisionally in *Arphia* from which as he admits, it must ultimately be removed. It is evidently closely allied to *Tomonotus* on one side and *Hippiscus* on the other.

12. *Circotettix undulata*, Thos.

Syn. *Edipoda undulata*. Thos. Geol. Surv. Terr. 1871. 46.

Several specimens, males and females from Colorado, taken in July. Mr. Scudder has established the genus to which this is now referred chiefly on the variation from other species in the form and nervation of the wings which are peculiar. It approaches very nearly *Æ. ochraceipennis* of South America and may be identical with it.

13. *Circotettix carlingiana*, Thos.

Syn. *Edipoda carlingiana*. Thos. Proc. Acad. Nat. Science. Phila. 1870. 81.

A few specimens from Spring Lake, Utah, taken in July.

As Mr. Scudder has omitted the carvings of the head from his diagnosis of this genus, I add a description of them here as shown in the two species now before me.

First. *C. undulata*; occiput somewhat prominent and convex, vertex rather broad between the eyes, width about equal to the length of the eye, excavated, forming a large central foveola with somewhat

prominent margins, which have a distinct angular expansion just in front of the anterior corner of the eye, from this point they approximate and unite with the margins of the frontal costa, at the fastigium they send obliquely inward and backward a short branch from each side, which unites with the more or less prominent median carina; at the tip of the fastigium just in front of these lateral branches, there is a sudden depression or foveola. Frontal costa distinctly sulcate throughout, expanding at the ocellus and contracting immediately below it. Lateral foveola of the vertex triangular, somewhat excavated. *C. carlingiana* differs only in having the vertex broader, and less excavated; and the frontal costa above the ocellus solid, not sulcate.

The pronotum in each of these species, has the median carina distinct, but not cristate on the front lobes (rather more so in the latter, *carlingiana*,—than the former), scarcely apparent on the posterior lobe, twice severed by the cross incision, the anterior extending to the lateral lobes. The disk of the posterior lobe is slightly elevated and nearly flat; posterior margin rectangular. As a matter of course the prosternum is unspined. The wings of *carlingiana* are rather broader than *undulata*, the posterior extension (when spread) reaching nearly or quite to the tip of the abdomen in the male; sub-papilioniform, with undulate or rather semi-crenate margins; the transverse veins arranged as in *undulata*, but more distant from each other and slightly more irregular; the alternate longitudinal veins more than usually prominent and thick, retaining their size to the very margin; in *carlingiana*, these are usually black.

14. *Trimerotropis fontana*, Sp. nov.

Ash-brown, with dark fuscous bands.

Female.—Vertex about as wide between the eyes as the shortest diameter of the latter; somewhat elongate, margins distinctly carinate, sub-parallel between the eyes, converging in front, and suddenly bent back at the fastigium so as to form an obtuse V, pointing back into the central foveola; central foveola oblong or sub-elliptical with a distinct median carina; lateral foveola triangular, distinct, lower margin usually arcuate; a pit or depression in the fastigium just before and partially between the recurved branches of the marginal carina. Frontal costa rather broad, of nearly uniform width, slightly expanding at the ocellus; sulcate throughout. Pronotum slightly corrugated on the front lobes; median carina distinct on the anterior lobe, nearly obsolete on the posterior lobe, twice severed by cross incisions; the posterior in front of the middle and extending to the sides, slightly depressed at the point where crossed by the posterior sulcus; lateral carinae obsolete on the anterior lobes, sub-distinct on the posterior.

Elytra passing the abdomen, about as long as the body. Posterior femora about the same length as the abdomen.

Color.—Ash-brown, head and pronotum darkest and without distinct markings. Elytra trifasciate with dark fuscous; the band next the base darkest and extending from the costal margin half way across; second, which is about the middle, extending nearly or quite across; third band, indistinct and situated about one-third the length from the tip; apical portion transparent, marked with a few pale fuscous spots. Wings pale transparent yellow at the base; crossed beyond the middle by a rather narrow, slightly crescent-shaped fuscous band; apex transparent, with dark nerves. Posterior femora black, (possibly dark blue when living), at the base internally, with a black band toward the apex; apex black internally and fuscous externally. The antennae appear to be marked in some specimens with indistinct pale annulations.

Male. The central foveola of the vertex more excavated not so distinctly closed in front; the V form carinæ of the fastigium wanting or indistinct, and the pit or depression apparently in the front part of the central foveola, which is extended farther forward than in the female; frontal costa narrower, more distinctly sulcate, and slightly expanding below. Disk of the pronotum more distinctly granulose. The fuscous band of the wing less distinct than the female. Middle tibiæ with three black rings, most apparent internally, one near the base, one below the middle and a small one at the tip.

Dimensions:—♀. Length to the tip of the abdomen 1.10 in.; elytra 1.10 in.; posterior femora 0.55 in. ♂. Length to tip of abdomen 0.90 in.; elytra 0.90 in.

Two females and one male taken at Spring Lake, Utah. July.

This species approaches very near *T. citrina*, Scudd., and may possibly be identical with it, or his *T. vinculata*, the description of the latter I do not have at hand, and unfortunately for me the author describes his *T. citrina* in part by reference to that species.

15. *Mestobregma kiowa*, Thos.

Syn. *Ædipoda kiowa*. Thos. Geol. Surv. Terr. 1871, 461.

Pesinidia kiowa. Thos. Surv. West. 100th Merid. Vol——? 885.

One female from Mt. Nebo, Utah.

When I first described this species and *Æ. plattai*, by some means the type specimens were changed, and in looking afterwards at them in the Agricultural Department I found that an *Æ. kiowa* was marked as the type of *Æ. plattai*, I have therefore in one or two places, for example in my paper in the *Report Surv West 100th Merid.*, suggested that the latter specific name should be suppressed, but the specimens found in the present collection, together with Mr. Scudder's paper in the Bulletin of the U. S. Geol. Surv. satisfies me that these two species do exist and are distinct, also that my Synopsis is correct, the mistake having been made in marking the specimens.

The specimens now before me cannot be referred to *Æ. plattai* as the wings are pellucid without the faintest sign of a fuscous band.

In order to assist as much as possible in determining satisfactorily the species of this somewhat difficult group, I add some features from the specimen before me.

The central foveola of the vertex has, sometimes, a minute tubercle near the center; lateral foveola sub-triangular, very shallow and nearly perpendicular; frontal costa deeply sulcate throughout and reaching to the clypeus; lateral facial carinæ somewhat abruptly and strongly curved outward; there is a somewhat distinct transverse ridge across the vertex from the upper canthus of one eye to that of the other. Pronotum short, scarcely longer than the head; constricted near the middle, but not to that extent implied in my description in the Synopsis; median carina slightly prominent, twice distinctly severed, the portion on the anterior lobe somewhat arched; the posterior sulcus about the middle

The upper field of the elytra membranous, pale, sprinkled with

pale fuscous dots; lower half crossed at the base by an irregular broad brown band, behind this a broad whitish space, behind this a distinct brown or dusky band, not so broad as the whitish space, this band is just about the middle of the elytra; behind it is another whitish space which is narrow; apical portion membranous, sprinkled with brown or fuscous spots, fading toward the apex. Antennæ pale at the base, dusky toward the apex. The elytra are longer in proportion to the body than given in my Synopsis.

Length of body: 0.85; of Elytra, 0.90.

16 *Spharangemon collare*, Scudd.

Syn. *Ædipoda collaris*. Scudd. Hayden's Geol. Surv. Neb. 250.

Spharangemon collare. Scudd. Proc. Bost. Soc. Nat. Hist. XVII, 1874-5.

Two specimens, ♂ and ♀, taken in Wyoming. September.

Mr. Scudder has established the new genus, here given, for the limited group to which this species belongs, yet this would appear to be scarcely necessary as it approaches so near to *Ædipoda*, as now restricted, (supposing *Æ. carolina*, to be the type) that no important generic characters separate the two. I may remark here, without attempting to discuss the question, that if we take *Æ. carolina* as the type (but in my opinion *Æ. coerulescens*, Linn. is the proper type of *Ædipoda*) and establish genera on the slender differences presented in the species of *Spharangemon*, it will not be possible to retain *Æ. trifasciata*, Say in *Ædipoda* as Stål has done, unless we abandon the more striking characters which go to make up the general appearance, and follow one or two arbitrarily chosen characteristics.

17. *Spharangemon aequale*, Say

Syn. *Gryllus aequalis*, Say. Jour. Acad. Nat. Sci. Phila. IV, 307.

Locusta aequalis. Harr. Rep. 583.

Ædipoda aequalis. Erich's Arch. of Nat. IX, 230.

Trimerotropis aequalis. Scudd. Geol. N. Hamp. 31, 337.

Spharangemon aequale. Scudd. Proc. Bost. Soc. Nat. Hist. XVII, 1874-5.

Specimens taken at Spring Lake, Utah. July.

Var. With disk of pronotum pale ash-color.

18. *Cratypedes Putnami*, Sp. nov.

Female.—Head globose, its corners well rounded, crown or occiput convex but not elevated. Vertex broad between the eyes, the width rather more than the length of the small roundish eyes; transverse; central foveola shallow with a short median carina through the anterior half, at the posterior end of which there is a minute transverse carina not reaching the margins, but forming a T with the longitudinal one; minute tubercles are also sometimes visible on the sides of this median carina; marginal carinae rather minute, nearly parallel

between the eyes, converging in front so as to form an obtuse angle, it continued until they would meet, but confused at the tip with the margins of the frontal costa and outer margins of the lateral foveolæ; lateral foveolæ irregularly ovate, distinct. Frontal costa of medium width, sulcate throughout, reaching nearly or quite to the clypeus, with a short, minute median carina above the ocellus, making this part appear tricarinate; expanding at the ocellus, contracted immediately below it. Pronotum somewhat constricted immediately behind the front margin, expanding posteriorly; posterior sulcus in advance of the middle, notching the median carina and extending to the lateral lobes; anterior sulcus in some specimens dividing the median carina, in others merely forming a depression; median carina distinct throughout, slightly elevated, but scarcely sub-cristate; lateral carinæ sub-distinct; dorsum rugos, tubercles on the posterior lobe elongated; posterior margin rectangular. Elytra of moderate width, passing the abdomen slightly; wings of moderate width and distinctly shorter than the elytra. Posterior femora not reaching the tip of the abdomen. As Mr. Scudder has failed to mention it in his diagnosis of the genus, I may add that the prosternum is unarmed.

Color.—(The specimens when received were pinned and dried, but appear to have been immersed in alcohol.) Fuscous-brown with pale spots and stripes. Mouth parts and sides of the head dusty yellow, or ochre, with minute dusky points, face brownish, or as the sides; usually there is a dark stripe extending from the hind margin of the eye to the front margin of the pronotum. Pronotum varying from pale ash-brown to brown, with a more or less distinct yellowish stripe along the lateral margin of the disk of the posterior lobe; a dark stripe, variable in size, along the middle of the lateral lobes, most distinct near the front margin. Elytra brown with an irregular, pale yellowish, band about one-third the length from the base; another a little beyond the middle; apex membranous, marked with fuscous spots; narrow pale yellowish stripe along the angle (ulnar veins); anal field brown; in some specimens these pale bands, or spots are scarcely distinct and quite irregular. Wings pale yellow at the base, (may possibly have been red when living); a broad, dark-fuscous band occupies the third fourth, crossing back from the front margin somewhat obliquely outward to the hind margin, around which it curves in rather increased width at first, but decreasing as it proceeds, reaching nearly to the anal angle; it sends up nearly to the base a broad sub-costal dark ray; apex transparent, veins dark and a few fuscous spots near the tip. Posterior femora crossed externally by three oblique brown bands; colors of the tibiae have evidently faded to such an extent as to make it impossible to guess what they originally were.

Dimensions.—Length to the tip of the abdomen 1.20 in.; elytra 1.05 in.; posterior femora. 0.82 in.; width of elytra at the widest point 0.25 in.

Four females from Empire, Colorado, and one from Middle Park, taken in September. I have placed this species in this genus with some hesitancy, yet it certainly agrees very closely with it.

19. *Cedipoda utahensis*, Thos.

Cedipoda utahensis. Thos. Rep. Surv. West 100th Merid. 1876.

Four specimens, two ♂ and two ♀, taken at Spring Lake, Utah.

This belongs to *Cedipoda* as now restricted and is a very distinct species. I add some measurements:

Dimensions. ♀ Length to the tip of the abdomen 1.30 in.; elytra 1.25 in.; posterior femora 0.78 in.; from the fastigium to the tip of the pronotum 0.50 in. ♂ Length to tip of the abdomen 1.00 in.; elytra 1.05 in.

20. *Tropidolophus formosus*, Say.

Syn. *Gryllus formosus*, Say. Am. Ent., Lec. ed., I, 78.

Tropidolophus formosus. Thos. Synop. 138.

One ♀ from Valmont, Colorado

21. *Stauronotus*? *Ellioti*, Thos.

Stauronotus Ellioti, Thos. Proc. Acad. Nat. Sci., Phila., 1870. 82.

A re-examination of this species convinces me that it does not belong to *Stauronotus*; it is probable a new genus will have to be established for its reception.

22. *Brachystola magna*, Girard.

Syn. *Brachypeplus magna*, Girard. Marcy's Expl. Red River, La 260.

Brachystola magna. Scudd. Bull. Geol. Surv. 267. 1876.

Two females from Canon City, Colorado.

23. *Pezotettix obesa*, Thos.

Pezotettix obesa. Thos. Geol. Surv. Terr. 1871. 454.

Shoshone (Indian) name as ascertained by Mr. Putnam, "At-tung."

Two ♀ from Wind River, Wyoming, taken in July.

This species belongs to *Pezotettix*, as that genus is now limited by Mr. Stål. I add the following characters from the specimens before me in order to complete the description given in my Synopsis.

Frontal costa sometimes sulcate throughout; vertex rather broad between the eyes and strongly declivant. Pronotum as broad in front as the head, and gradually expanding posteriorly; the median carina minute and cut by the posterior sulcus much behind the middle; the posterior lobe equal about one-third the length of the pronotum and finely granulated; the posterior margin slightly emarginate or sinuate, not produced. I have a specimen from Idaho in which the median carina is not distinctly severed by the posterior sulcus, but is depressed at the middle sulcus. In this specimen the posterior margin of the pronotum, and of each abdominal segment, is regularly marked with minute black dots.

24. *Pezotettix Dodgei*, Thos.

Syn. *Caloptenus Dodgei*. Thos. Can. Ent. 1871. 168.

Pezotettix Dodgei. Thos. Synop. 158.

A few males marked "Alpine" from Colorado, taken in September, and one ♀ marked "Sub-alpine" from the same Territory taken in August.

As Mr. Scudder complains that my description is not satisfactory, and as I have been in doubt in reference to the female,—an undoubted specimen of which is now before me,—I add the following characters:

Male. Eyes rather large, ovate. Vertex narrow between the eyes, scarcely equal half the shortest diameter of the latter; a minute median carina sometimes present; the salcus or central foveola closed in front. Frontal costa rather broad, flat, expanding slightly at the ocellus and not sulcate; obsolete below. Pronotum sub-tricarinate; median carina distinct only on the posterior lobe; lateral carinae obtuse, and rounded; posterior sulcus behind the middle, all three crossing the dorsum and confined to the posterior half of the anterior lobe; posterior margin forming a very obtuse angle, slightly rounded at the apex. Elytra (in the specimens before me) only about one-third the length of the abdomen. Cerci slender and tapering, not enlarged toward the tip. Posterior femora scarcely as long as the abdomen. Pulvilli, or pads between the claws, very large, obovate.

Color. Brown varied with cinereous. The margins of the disk, and lower portion of the lateral lobes of the pronotum cinereous; a black stripe extends from the eyes along the middle portion of the sides of the pronotum, to the posterior sulcus. In the specimens before me, the white bands of the posterior femora are not so distinct as in those from which the original description was taken; the color may be more properly described as cinereous with two intermediate brown bands, a small brown spot at the base and the apex of the same color.

Female. Similar, except that it is much larger, rather darker, and the elytra have a few small, quadrate, dark spots along the middle field; the median carina of the pronotum more apparent on the anterior portion of the front lobe. Dimensions as given in my Synopsis except the tibiae, which in the present specimen measure 0.37 of an inch.

The head and pronotum of this species are decidedly *Caloptenoid* in appearance—taking *U. fumur-rubrum* as the American type.

25. *Pezotettix unicolor*? Thos.

Pezotettix unicolor Thos. Synop. 151.

One ♀ from Colorado, marked "Sub-Alpine," taken in August. I give this specimen as *unicolor* with some doubt as it varies slightly from the type, which was obtained in Jackson Co., Illinois.

26. *Pezotettix picta*, Thos.

Pezotettix picta, Thos. Proc. Acad. Nat. Sci. Phila. 1870. 78.

Several specimens of this pretty species were obtained in Colorado. This approaches, in generic characters, very nearly to *Dactilotum*, Charp. yet is distinct.

27. *Caloptenus spretus*, Thos.

Several specimens of this destructive species are in the collection; most of which were taken near Stinking River, Wyoming.

28. *Caloptenus femur-rubrum*, DeG.

A few specimens taken in Iowa. These belong to the typical form, but they and all others obtained within the last two or three

years appear to me to be slenderer and more like Riley's *Atlantis* than in former years. That this species has been undergoing some modification in the Mississippi valley within the last three or four years I think, must be admitted. Although Riley's *Atlantis* is certainly but a variety of *femur-rubrum*, yet it can be separated from the latter at a glance, and when the specimens are fresh without opening the wings or examining the posterior abdominal segment; the characters are certainly more marked than those which separate some of Mr. Scudder's *Stenobothri*, *Arphia* and *Calopteni*.

29. *Caloptenus bivittatus*, Say.

(For the numerous Synonymys see my Synopsia.)

The collection contains some fine specimens from Spring Lake, Utah, taken in July. One of the females measures 1.75 in. to the tip of the abdomen; a male measures 1.25 in. to the tip of the abdomen, 1.50 to the tip of the elytra. The outside and inside of the posterior femora are marked with a very distinct dark stripe, running the entire length; upper half of the posterior tibiæ black or dark fuliginous. Mr. Scudder, in his Report on the Orthoptera of the Northern Boundary Survey, says that *C. femoratus* Burm. may be distinguished from *C. bivittatus*, Say, by the color of the hind tibiæ. I can not help thinking it somewhat strange that he puts so much reliance in this character, especially in that particular group of Acridii to which this species belongs. In *C. bivittatus* the color of the posterior tibiæ is exceedingly variable, passing through all the shades of blue, scarlet, purple, red, olive, yellow and fuscous. In the mountains of Northwestern Pennsylvania they are often of a dark olive color; in Nebraska just south of the mouth of Platte River they are found of a bright yellow; at a certain point in Colorado south of Denver they are of a purplish or blue color, and if immersed in alcohol, will, as they fade, change from blue to purple, then to deep red, then to a clear pale red, and finally to dull yellow; if dried they pass, in part, through the same changes, but do not become yellow.

30. *Caloptenus occidentalis*? Thos.

Caloptenus occidentalis, Thos. Geol. Surv. Terr. 1871. 453.

There are a few specimens, males and females, taken at Spring Lake, Utah, in July, which I am inclined to refer to this species, although differing somewhat from the type. I neglected to state in my Synopsis, that the lateral carinæ of the pronotum are obliterated on the anterior lobes and sub-distinct on the posterior lobe; the posterior sulcus is behind the middle; the sulcus of the vertex often has a distinct though minute median carina in the female; the eyes are rather large, prominent and approximate at the apex. This species evidently approximates *Hesperotettix viridis* in the characters of the head and pronotum.

31. *Hesperotettix viridis*, Thos.

Syn. *Caloptenus viridis*. Thos. Geol. Surv. Terr. 1871. 450.

Ommatolampis viridis. Thos. Synop. 156.

Hesperotettix viridis, Scudd. Bull. Geol. Surv. 262. 1876.

One ♀ from Mt. Nebo, Utah, taken in August; and one from Spring Lake.

32. *Acridium emarginatum*, Uhler.

Acridium emarginatum. Uhler in Scudd. Notes Geol. Surv. Neb. 250.

There are two specimens, one ♂ and one ♀, in the collection, the former marked "Iowa," the latter "Spring Lake, Utah." The former I am satisfied belongs to this species, the latter, although approaching *A. shoshone* has the dorsal stripe and is not specifically distinct from the former. If Mr. Putnam has not made a mistake in reference to locality, this species has a much wider range than I had supposed. It is fond of localities where vegetation is luxuriant, and although found as far east as Normal, Illinois, I was not aware that its range extended further west than eastern Colorado.

LOCUSTIDÆ.

There are comparatively few specimens of this family in the collection, yet there are some which are seldom seen and therefore of much interest.

1. *Cyrtophyllus concavus*, Harr.

Syn. *Platyphyllum concavum*, Harr. Rep. 3d ed. 158.

perspicillatum, Serv.

Cyrtophyllus concavus. Scudd. Bost. Jour. Nat. Hist. VII, 444.

One female from Iowa, taken in August. This species belongs to *Cyrtophyllus*, Burm, as now limited by Stål.

2. *Scudderia curvicauda*, DeGeer.

Syn. *Locusta curvicauda*, DeGeer, Mem. III. 446.

Phaneroptera curvicauda, Burm. Handb. Ent. II. 961.

angustifolia, Harr. Rep. 3d ed. 160.

Scudderia curvicauda, Stål. Ofver. Vet. Akad. Forsk. 1873. No. 4. 41.

Two females from Iowa, taken in July.

3. *Decticus pallidipalpus*? Thos

Decticus pallidipalpus, Thos. Geol. Surv. Terr. 1871. 442.

Two females from Mt. Nebo, Utah, taken in August.

According to the most recent arrangement of the *Decticeidæ*, as given

by Mr. Otto Hermann, (Verhand. d. k.-k. Zool.-Bot. Ges. 1874), this species belongs to this genus as now limited.

In these specimens, the last joint of the maxillary palpi is very slightly bent; the posterior femora are smooth and unspined; the ovipositor is not exactly straight, being very slightly curved upward at the tip. It is possible therefore that they belong to a different species, but to determine this it will be necessary to have specimens in color.

4. *Steiroxys*? *Hermannii*? Thos.

Steiroxys Hermannii, Thos. Surv. West 100th Merid. Vol.—? 904. (1876)

One female from Yellowstone National Park, Wyoming, taken in August.

I locate this specimen with much doubt as to both genus and species. I will not attempt a generic description at present, but reserve it for a future communication.

5. *Anabrus simplex*, Hald.

A few specimens of males and females from Spring Lake, Utah, August. Mr. Putnam states that the Indian (Shoshone) name of this species is "Mesch." [Abundant in Middle Park, Colorado, and along Wind River, in Wyoming.]

6. *Anabrus purpurascens*, Uhler.

Syn. *Thamnotrizon purpurascens*, Thos.

A male and female from Nebraska.

Mr. Scudder in his report on the Orthoptera of the Northern Boundary Survey, in speaking of this species, remarks: "Mr. Thomas, while retaining the generic name *Anabrus*, refers this species to *Thamnotrizon*; but wrongly, for it is congeneric with *A. simplex*, Hald. the type of the genus." What necessity there was for this remark in 1875 I cannot possibly see, when I had already in the Report of the Geol. Surv. Terr. 1871 made the correction, and for the reasons given; a Report which Mr. Scudder must have had before him. He should at least, after having mentioned the first, in simple justice to me, have mentioned the fact that I had restored the species to its original position.

There is one specimen in the collection which makes a somewhat close approach to *A. coloratus*, Thos. in color and markings.

7. *Cyphoderris monstrosus*, Uhl.

Cyphoderris monstrosus, Uhler. Proc. Ent. Soc. Phila. 1864. 552.

Two males from Wind River, Wyoming Territory.

These are the first specimens of this singular species I have seen, but Mr. Uhler's generic and specific descriptions are so complete and full that I feel no doubt in reference to the identification.

8. *Stenopelmatus fasciatus*, Thos.

Two specimens, a male and a female from Wind River, Wyoming Territory.

From Mr. Putnam's note, I learn that the Indian (Shoshone) name of this species is "Nen-i-gui-po."

9. *Ceuthophilus pallidus*? Thos.

One male from Empire, Colorado, taken in September.

Apparently immature and with doubt to this species.

10. *Ceuthophilus utahensis*, Nov. Sp.

Male. Vertex rounded without any tubercle. Antennæ more than twice the length of the body; third joint of the antennæ twice as long as the second. Ultimate joint of the maxillary palpi nearly twice the length of the fourth, slightly enlarged toward the apex and somewhat bent or arcuate. Anterior femora with one or two spines beneath, near the apex and on the inner margin; anterior tibiae without any spines in front, two rows of spines beneath, with three in each row (counting the lower ones.) Middle legs as the anterior, except that the tibiae have four spines above in two rows, two in each row. Posterior femora very broad, about twice the length of the abdomen, with numerous minute spines on each margin beneath, those on the outer margin more robust than those on the inner margin; deeply channeled beneath. Posterior tibiae longer than the femora, distinctly arched or curved outward near the top; with four pairs of strong, nearly opposite spines on the upper surface, with five or six minute intervening spines; these minute spines extend above the upper pair almost to the top. Cerci robust elongate-conical, hairy, about as long as the pronotum.

Color. (Alcoholic specimen.) Body dark testaceous brown, with markings of pale yellow; the central portion of the pronotum yellow, granulated with brown, somewhat divided into two spots by an oblong pale brown median spot; the other segments of the thorax and of the abdomen have the anterior half testaceous yellow, and the posterior half brown. Legs dull yellow, the posterior femora with a network of brownish lines.

Dimensions. Length 0.62 in.; posterior femora 0.51 in.; posterior tibiae 0.58 in.

One male from Mt. Nebo, Utah, taken in August.

GRYLLIDÆ.

I notice in the collection a number of specimens of *Gryllus luctuosus* Serv.; *Nemobius vittatus*? Harr. and *Æcanthus niveus* Serv. There may be other species among them, but I have not had time yet to study them.

NOTES.

BY J. D. PUTNAM.

Ischnoptera bivittata, N. Sp., (page 250), was quite common about houses in San Francisco, California, during my visit there in October, 1875. Not suspecting it to be a new species, I did not send Professor Thomas all the specimens—one of which appears to be a female. It differs mainly in being larger, rather darker colored, and in having the eyes black instead of ashen-blue. (Plate XXXVI, Fig. 1 ♂, 2 ♀.)

Circotettix undulata, Thos. (Page 254.) The specimens returned to me under the above name were collected at Spring Lake Villa, Utah, July 1875; while the specimens marked *C. carlingiana*, Thos. were collected in Middle Park, Colorado, Sept. 1872

Brachystola magna, Girard, (Page 259,) was quite common at Canon City, Colorado. Well preserved specimens of this species were frequently found in sandy places completely dried by the sun. These make very good cabinet specimens, the colors being much better preserved than any others I have seen. Various other insects were found preserved in the same manner.

Caloptenus spretus. I have collected this species in various parts of Colorado. It was quite plentiful on the plains between Denver and Boulder City, in June 1872, and later in the season, I found it abundant in the mountains, at Empire City. On August 1st, they were very abundant high up above the timber line on Parry's Peak. Vast numbers were chilled by the snow and lay at the base of the snow drifts in heaps. They could be seen filling the air like snow flakes to a great height above the extreme summit of the peak,—13,133 feet. The wind was from a westerly direction. In September, this year (1872) I found them in great abundance in Middle Park. In 1874 I first noticed this species on Gold Hill, Boulder county, July 8th, and on July 11th they appeared at Valmont and other places on the plains in great abundance, and did great damage. They received several large reinforcements during the following week. After remaining several days these seemed to disappear, but only to make room for another swarm, and thus they kept coming and going during the rest of the summer, until nothing eatable was left. At Empire City, they were very abundant during the whole of my stay from August to October, but they seemed to eat but very little, if any thing. At Canon City in October, I found them very abundant. They were very sluggish, and the side walks were covered with the dead and dying. Large numbers were seen paired. The young grasshoppers hatched out abundantly early in April 1875. In 1873 I found them in different

parts of Western Wyoming, between Fort Bridger and the Yellowstone Lake, but on the plain bordering the Stinkingwater River, in July they were more abundant than I had ever seen them elsewhere before.

In June 1875, I collected a few near the Transfer Depot at Council Bluffs, Iowa. This is the most eastern locality I have yet seen it. In Utah last summer I failed to see a single specimen, although I looked specially for it.

Caloptenus bivittatus, (Page 261). I have also from Iowa. There is also in the collection a specimen of *Caloptenus differentialis* from Iowa.

Aceridium emarginatum, (Page 262) was certainly taken in Utah, where it was not uncommon in the vicinity of orchards in August.

Anabrus simplex, (Page 263), I found very common in Middle Park, Colorado, in September 1872. Scarcely any two specimens were colored alike. The male was frequently seen "singing" while seated in the top of a wild sage bush,—the females being found on the ground below. It was also common in the valley of the Wind River, Wyoming in July 1873. It is called "Mesch" by the Shoshone Indians, who are said to sometimes use it for food. In Utah last year I noticed but very few specimens. It is called "War Cricket" by the Mormons and is said to occur in great numbers in some years, and has several times almost entirely destroyed their crops.

Anabrus purpureascens. (Page 263.) I do not remember to have collected any specimens of Orthoptera in Nebraska, as I only passed through on the railroad. But high up above timberline on Gray's Peak, and on other peaks near Empire City, I collected a number of specimens of a species of *Anabrus* which does not seem to be mentioned by Dr. Thomas.

Stenopelmatus fasciatus, (Page 264.) I also found at Spring Lake, Utah, where it is not uncommon, and is called "Sand Cricket" by the Mormons who frequently plow them up in the spring.

The following species contained in the collection are, from some cause, omitted in the list. *Oedipoda carolina* from Iowa; *O. Haydenii* from Canon City, Colorado; *O. coralipes*, Empire, Colorado, Spring Lake, Utah; *O. phaneroptera*, Iowa. All specimens mentioned in this list from Iowa were collected near Davenport.

In printing the article on Orthoptera by Dr. Thomas, several important mistakes were made. These were corrected by the author in the proofs, but owing to a misunderstanding a portion of the forms were printed before the corrected proof was received.

Page 253. Line 10, after *triviridatus* place an interrogation—[?]

" " " 30-35, erase *simplex*, *conspersa* and *luteola* from the list of synonyms.

" 254. Erase the third paragraph.

" 257. For *Spharagemon* read *Spharagemon*.

" " Line 22. For *in* read *by*.

" " " 37. "*Putnami*" "*Putnamii*."

" " " 44. "on" "at."

" 260. " 43. "*Dactylotum*" "*Dactylotum*."

" 264. " 30. "*granulated*" "*dotted*."

Since the printing of the Lists of COLEOPTERA and LEPIDOPTERA found at Davenport (Pages 169-177), a considerable number of additions have been discovered, but as they have not yet been fully determined they will be reserved for a future list. A number of errors no doubt exist in all the lists. Those that have been noticed will be indicated in the errata.

DAVENPORT, July 15th, 1876.

Plates XXXV and XXXVI.

Since the preceding sheets were printed it has been decided to have two plates engraved illustrating the several new species of insects described in this volume.

Plate XXXV, Fig. 1.	<i>Nomada Putnami</i> Cresson.	Page 210.
2.	<i>Anthophora albata</i> Cresson.	" 211.
3.	<i>Dyschirius salivagans</i> Le Conte.	" 268.
4.	<i>Tanarthrus salicola</i> Le Conte.	" 268.
5.	<i>Papilio indra</i> Reakirt. ♀	" 182.

The descriptions of the two species of beetles are, for the sake of reference, reproduced below from the Proc. Am. Ent. Soc., Vol. V, Nov. 1875. They were both collected on a salty mud flat near the southern extremity of Utah Lake, July 5th, 1875, in company with a large number of other species of Coleoptera—for a full list of which see page 200. Neither of these species were found on a later visit to the same locality in September. The female of *Papilio indra* figured is one of two specimens taken in Clear Creek Canon, July 1st, 1872. The other specimen differs somewhat in its markings. So far as is known, no one else has collected the female, and it has not before been figured.

Plate XXXVI, Fig. 1.	<i>Ischnoptera bivittata</i> Thomas ♂	Page 250.
" " 2.	" " " ♀	" 265.
" " 3.	<i>Psoloessa coloradensis</i> Thomas ♂	" 252.
" " 4.	" " " ♀	" 252.
" " 5.	<i>Trimerotropis fontana</i> Thomas.	" 255.
" " 6.	<i>Cratypedes Putnamii</i> Thomas.	" 257.
" " 7.	<i>Cyphoderris monstrosus</i> Uhler.	" 263.
" " 8.	<i>Ceuthophilus utahensis</i> Thomas.	" 264.

Descriptions of Coleoptera.

BY DR. J. L. LE CONTE.

[From the Transactions of the AMERICAN ENTOMOLOGICAL SOCIETY, Vol. V, November, 1875. Pages 169 and 174.]

Dyschirius salivagans, Lec. (Plate XXXV, fig. 3.)

Elongate, pale ferruginous, shining. Clypeus truncate, with the angles slightly prominent and rounded, sides of front rounded, distinctly separate from the angles of the clypeus; frontal impressions deep, rugose, connected by a deep transverse line, vertex slightly punctulate. Prothorax longer than wide, oblong oval, scarcely narrower in front. Elytra elongate, cylindrical with well marked slightly puctured striae, effaced towards the base, but not at the tip; dorsal punctures two, situated on the third stria; marginal stria abbreviated at the humerus. Front tibiae scarcely denticulate, apical process longer than the terminal spur and curved. Length 4 mm.; 0.16 in.

[Burrowing in salty mud near Utah Lake, Utah, in company with *D. patruella*, Lec., various other *Carabidae*, etc. See page 200].

"Allied to *D. pallipennis*, but larger and more slender, with the sides of the front more rounded, and the angles of the clypeus more prominent and rounded, almost as in *D. sellatus*; from which, however, it also differs by the more elongate form, and by the striae of the elytra effaced for a greater distance near the base. The head is not rugose, and only very sparsely punctulate. This is a very interesting addition to our fauna, carrying as it does, the distribution of the *pallipennis* group into the closed basins of the interior of the continent."—LE CONTE.

Tanarthrus salicola, Lec. (Plate XXXV, fig. 4.)

Depressed, ferruginous, opaque, very finely and densely punctulate, finely pubescent. Head large, hind angles rounded, vertex with a narrow indistinct smooth space, occiput with a very short impressed line. Prothorax cordate, constricted near the base, dilated in front, where it is scarcely narrower than its length. Elytra wider than the prothorax, dusky at base and tip, and with a faint dusky, transverse band at the middle. Antennae with eleventh joint equal to the two preceding united, slightly constricted at the middle. Length 3 mm.; 0.12 in.

[Burrowing in salty mud near Utah Lake, Utah, in company with *Anthicus rejectus*, Lec., *Heterocerus cuniculus*, Kless., the *Carabidae* above mentioned, etc.]

"Similar in form to *T. salinus* but much smaller and easily recognized by the head and pro-thorax as densely punctured as the elytra, the more cordate prothorax, the dusky elytral bands and finally by the less elongated terminal portion of the eleventh joint of the antennae."—LE CONTE.

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ERRATA.

- Page 43 Line 6 *Insert* "Plate VII, fig. 7."
- " 109 " 20 *For* "Plate VII" *read* "Plate XVI."
- " — In the lower part of the last column of Table No. 1, erase the decimal points.
- " 136 " 15 *For* "Dolium" *read* "Cassia."
- " 136 " 30 " "Most" " "none."
- " 142 " 13 *Erase* "the lower surface of."
- " 164 " 32 *For* "Caex" *read* "Carex."
- " 165 " 45 " "Lea" " "Say."
- " 166 " 30 " "Planorbella" *read* "Planorbula."
- " 166 " 36 " "Mentens" " "Menetus."
- " 167 " — *Insert* under *HELIODÆ*.
Helix striatella, Anthony.
" *perspectiva, Say.*
Pupa armifera, Say.
- " 168 last line *For* "unulatus" *read* "lunulatus."
- " 171 Line 4 *Coccinella munda, Say* — *Cycloneda sanguinea, Linn.*
- " 171 " 23 *Diploaxis n. sp.* — *D. innoxia, Lec.*
- " 171 " 39 *Podabrus rugosulus, Lec.* — *P. rugosulus, Lec.*
- " 173 " 14 *Bruchus near Seminatum* — *Mylabris near seminulum, Horn.*
- " " 22 *Phylotreta* — *Orchestris.*
- " " 29 *Baradius* — *Baris.*
- " " 32, 33 *Clytus* — *Cyllene.*
- " 177 " 22 *Xelentus* — *Xyleutes.*
- " 178 " 34 *Hydroporus catescopium, Say* — *H. griseostriatus, DeG.*
- " 179 " 22 *Tribrachys caudis, Lec.* — *T. caudicollis, Lec.*
- " 180 " 39 *Clytus lezcouonus, Lap.* — *Xylotrechus leucozonus, Lap.*
- " " 40 *Stenostota pergrata, Say* — *Mecas pergrata, Say.*
- " 182 " 16 *Dendrocinus terebrans, Lec.* — *Dendroctonus terebrans, Lec.*
- " 191 " 10 *Brachys terminans, Fab.* — *B. aerea, Mels.*
- " 192 " 27 *For* "Phrysonomia" *read* "Phrynosoma."
- " 210 " 35 *For* "♂" *read* "♂."
- " 211 " 1 *For* "Anthaphora" *read* "Anthophora." *and for* "♀" *read* "♀."
- For some other corrections see page 267.



EXPLANATION OF PLATES.

EXPLANATIONS OF PLATES.

PLATE I.

Plan of the group of mounds on the "Cook farm," west of the city; with lines showing the high water mark, and heights above high water-mark, in feet.

Scale—1 inch to 200 feet.

See description, page 117, *et seq.*

PLATES, II AND III.

Sections and plans of mounds of the Cook farm group, described at page 117, *et seq*

PLATE IV.

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“ 6. Pipe of red pipe stone from a large mound in Rockingham Township, 7 miles below Davenport.....	113
“ 7. Pipe of bluish pipe stone, very smooth and perfect, from Mound No. 9, Cook farm group.....	122
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Scale $\frac{1}{4}$.	

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Scale $\frac{1}{4}$.	

PLATE V.—A.

The portion of the cloth on copper axe No. 12, enclosed by the line on this figure, enlarged 4 diameters. See page..... 129

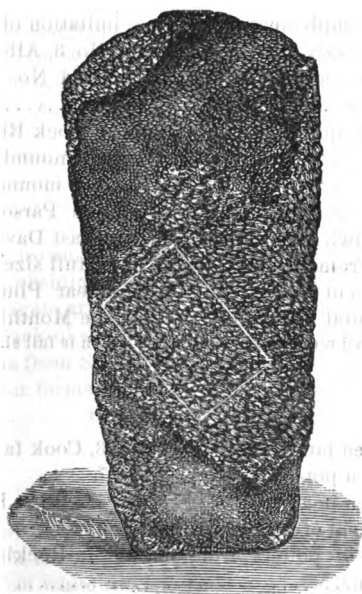


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" 5.	" " " " No 4, Shaw's farm, Toolesboro, Iowa.....	107
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	Awls reduced $\frac{1}{2}$.	
" 12.	Copper bead or ear-pendant—full size, Mound 3, Cook farm.....	119
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" 9.	Fragment of skull from mound near Pine Creek.....	109
(See "Cranial Amulets," Pop. Science Monthly, Sept. 1875.)		
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" 6.	Flat discoidal sandstone, with circles. marked on it, from a mound on Cook farm.	

In the following Plates are presented illustrations of some of the principal forms of flint and stone implements in the Museum of the Academy of which no detailed description has been given.

PLATE IX.

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- | | | | |
|-----|----|---|-----|
| Fig | 1. | Spear of dark, translucent hornstone, from a mound on Smith's Island, Pleasant Valley, Iowa, collected by Capt. W. P. Hall. | |
| " | 2. | Light flint, with brown specks, from Mound 9, Cook farm | 122 |
| " | 3. | Very white flint, | 122 |
| " | 4. | Black flint, | 120 |
| " | 5. | Gray flint, from mound on Parsons' farm Toolesboro. | 111 |
| " | 6. | Blue flint from Mound No. 5, Shaw's farm, Toolesboro. | |
- All full size.

PLATE X.

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| Fig. | 1. | Arrow of light colored flint from Mound No. 1, Albany, Ills. | 102 |
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| " | 6. | " reddish brown, from Toolesboro. | |
| " | 7, 8. | " light colored, " " | |
| " | 9, 10. | " gray flint, " Mound 3, Cook farm. | |
| " | 11. | " dingy white flint, " 3, " " | |
- All full size.

PLATE XI.

- | | | | |
|------|------------|---|-----|
| Fig. | 1. | Light brown, translucent quartz; from Platte River, Neb. | |
| " | 2. | Black obsidian, (same as fig. 2, Pl. X) | 136 |
| " | 3. | Moss agate arrow, from railroad excavation near Denver. | |
| " | 4, 5, 6, 7 | Black obsidian, from Utah. | |
| " | 8,—13. | Flints from St. George, Utah; being six of the more peculiar forms contained in a collection of over fifty. | |
- Full size.

PLATE XII.

- | | | |
|-----|----|---|
| Fig | 1. | Arrow or spear of reddish flint or chert, from a mound on Rock River, near Milan. |
| " | 2. | Grayish white flint, worked to a sharp edge all around the base. |

- Fig. 3. Light colored flint, sharp edge all around.
 " 4. A dingy white flint.
 " 5. Dark slate colored flint, with a shallow groove worked
 across on one side.
 Full size.
-

PLATE XIII.

- Fig. 1. Arrow of white flint, very thin and flat.
 " 2. Arrow of white flint, the shaded portions being of a dark
 slate color.
 " 3. Gray flint, with black specks and worked quite smooth.
 " 4. White flint, shaded with horn color.
 " 5. Black flint.
 " 6. White flint.
 " 7. Rose tinted white flint; Rapids City, Ills.
 Full size.
-

PLATE XIV.

- Fig. 1. Light buff colored flint knife, very flat, average thickness
 about $\frac{1}{8}$ inch; from Wyalusing, Wis.
 " 2. Grayish white flint, very evenly convex on both sides;
 from Green River, Illinois.
 " 3. White flint, translucent.
 " 4. Gray flint, very thick.
 " 5. Light gray flint sliver, the narrow part worked down near-
 ly round.
 " 6. Bluish chert, with irregular black veins.
 " 7. Black flint
 " 8. Light flint, very sharp edges.
 Full size.
-

PLATE XV.

- Fig. 1. Flint implement, (shovel?) polished on both sides at the
 wider end and about one-third of its length, with very fine
 longitudinal striæ showing the wear which produced the
 polish to have been in that direction.
 a. More convex side.
 b. The flatter side.
 c. Longitudinal section.
 d. Transverse section.
 [See description of similar implements by Chas. Rau; Smithsonian
 Annual Reports, 1863 & 1868]
 " 2. Flint implement—very sharp and smooth at the rounded
 end.

PLATE XVI.

- Figs. 1, 1a. An implement of dark indurated slate, (probably) which was found at Moline, Ills.
- " 2, 2a. Brown hematite, very smooth and perfect. Found at Pleasant Valley, Iowa.
- " 3, 3a. White flint, plano-convex, or rather conical. Found on Credit Island, near Davenport.
- " 4, 4a. White flint, plano-convex, from the old fort ground at Toolesboro, Iowa.....Page. 109
- " 5. This is a drawing from a cast in the Museum of the Academy. The original is a very dark, indurated slate. The hole is not drilled entirely through, but to the depth of about $\frac{3}{8}$ of an inch on each side. It was found in Ohio, and is in the cabinet of Griswold College, this city.
- All full size.

PLATE XVII.

- Figs. 1, 1, 1. Side view, view of concave surface, and cross section of an implement of light colored granite, very smooth and symmetrical. Found near Davenport.
- " 2, 2, 2. Side view, longitudinal and cross sections of an implement of green-stone or trap; worked quite smooth from the middle to the sharpened end, the edges very square. Rapids City, Ills.
- " 3, 3. Side view and longitudinal section of an implement of green-stone, very smooth Le Claire, Iowa.
- Scale $\frac{1}{4}$.

PLATE XVIII.

- Figs. 1, 1, 1. Side view, longitudinal and cross sections of an axe of light colored granite found near Davenport.
- " 2. Grooved stone; light colored granite, nearly spherical, found at Davenport.
- " 3, 3. Side and end views of a similar but smaller one of green-stone. Le Claire, Iowa.
- " 4. Side view and cross section of a finely wrought implement of reddish quartzite, found at Davenport.
- Scale $\frac{1}{4}$.

PLATE XIX.

- Fig. 1 Side view and longitudinal section of a smoothly wrought green-stone implement, found at Rapids City, Ills.
- " 2, 2, 2. Side view, longitudinal and cross sections of a green-stone implement very smooth and perfect. Rapids City.

- Figs. 3, 3. Side view and longitudinal section of an axe of very dark green-stone, having a groove of peculiar form.
 " 4. Side view of a stone pestle or grinding stone, of light trap rock, from Rising Sun, Indiana.
 " 5. Section of a discoidal stone of rather soft, light colored sand-stone. Port Byron, Ills.
 Scale $\frac{1}{4}$.

PLATE XX.

Page.

- Side, back, and top views of three skulls obtained from Mound No. 1. Albany group..... 101
 Skull No. 3 has the lower jaw entire and the full set of 32teeth perfectly preserved.
 $\frac{1}{4}$ natural size.

PLATE XXI.

- Figs. 4, 5, 6, 7. Skulls from Mound No. 1, Albany, Ills..... 101
 " 26. Skull from the shell bed at lower end of the island of Rock Island. Scale $\frac{1}{4}$ 42
 " [A section of the cut where it was found is shown in Plate XXVI, fig. 1.]

PLATE XXII.

- Fig 9. Side and back views of a skull from Rock River, Mound No. 1..... 111
 " 10, 18. Skulls from same group, Mound No. 2..... 112
 " 11. Skulls " " " " 3..... 112
 Scale $\frac{1}{4}$.

PLATE XXIII.

- Figs. 12, 13. Skulls from Rock River Mound No. 3..... 112
 " 14. Skull from mound at Shabney Grove, Henry Co., Ills. 114
 Scale $\frac{1}{4}$.

PLATE XXIV.

- Figs. 15, 16, 17. Skulls from mounds in Henry Co., Ills.,..... 114
 " 19, 20 Skulls from Rock River, Mound No. 3,.. 112
 Scale $\frac{1}{4}$.

PLATE XXV.

- Figs. 21, 22 Skulls from mounds in Henry Co., Ills.
 " 23. Skull from Albany mounds,..... 114

ry dart
ht trap
colored

- Fig. 24. Skull from Rock River mound, No. 4.....Page 114
" 25. Skull from Rock River mound No. 3,..... 112
Scale $\frac{1}{4}$.

PLATE XXVI.

Fig. 1. Section of the strata near the foot of the island where the skull and bones and horn were found, described on page 42.

Page
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et

- a. Some loose earth which had been placed there within a few years.
b. The black surface soil, undisturbed
c. The shell-bed at the bottom of which the skull was found, *in place*.
d. Gravelly drift.
e. Limestone rock.

Fig. 2. Section and plan of the mound described on pages 64 & 65 (see note for explanations).

PLATE XXVII.

Hieroglyphics cut in a sandstone cliff near Murphy's Ranch on Little Popo-agie River, Wyoming. See page 143.

PLATES XXVIII—XXIX—XXX.

Hieroglyphics picked into large rounded boulders near the mouth of Summit Canon, Utah Co., Utah. See page 143.

PLATE XXXI.

Figs. 1a, 1b. Views of a Unio found near Rock Island, and described on pages 167-168. The engraving represents the line of nodes too strongly marked, especially on the lower half.

" 2a, 2b, etc. Fossil Pentamerus (sp.?) found in the Niagara limestone at St. Charles, Kane Co., Ills.

2b, and 2c, are two views of the same specimen.

The others are all representations of different specimens. None were found very perfect.

PLATE XXXII.

Section of the bluff two miles west of the city of Davenport, exposed by the C. R. I. & P. R. R. excavation. See page 96.

- Fig. 1. Recent surface soil.
" 2. Loess, or yellow clay.
" 3. Light ash-colored clay.
" 4. Peat.
" 5. Black soil.

- Fig. 6. Boulder drift.
 R. R. Bottom of grade at this time (1869.)
a. Position of the tusk, teeth and some bones of *Elephas*
primigenius.
b. Ancient ditch.

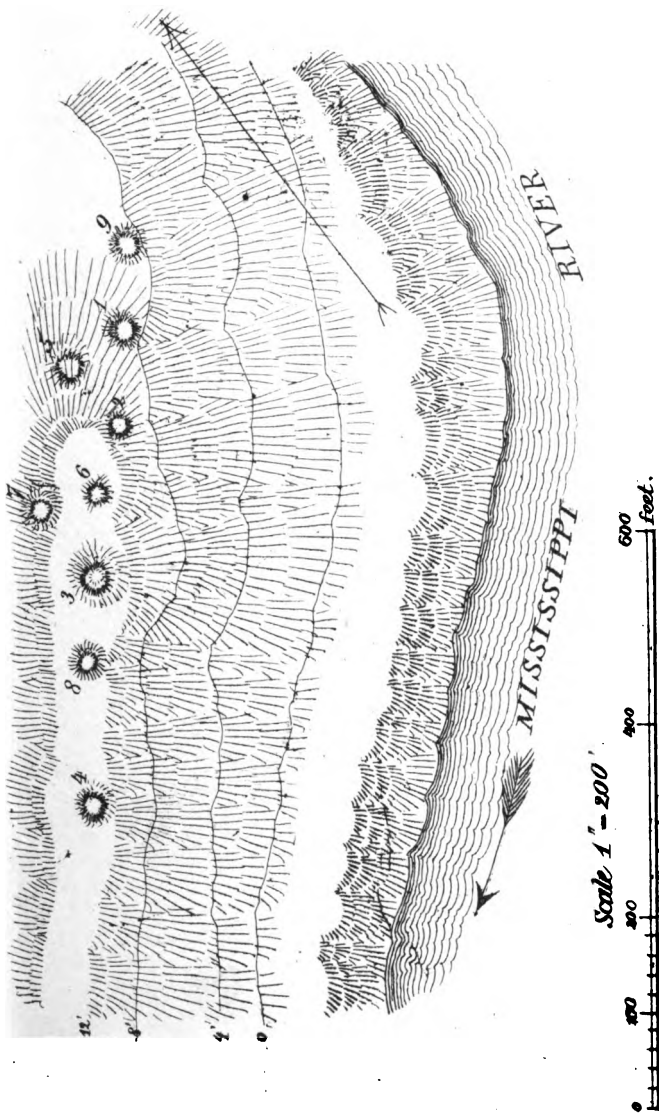
PLATE XXXIII.

Copper axe No. 12.....Page 122

PLATE XXXIV.

Upper figure, stone pipe No. 4.....Page 120

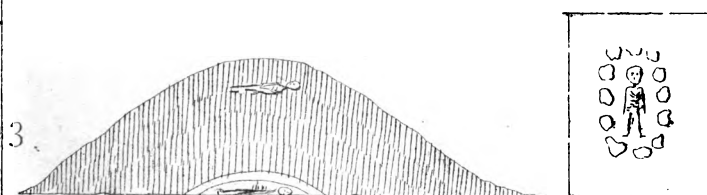
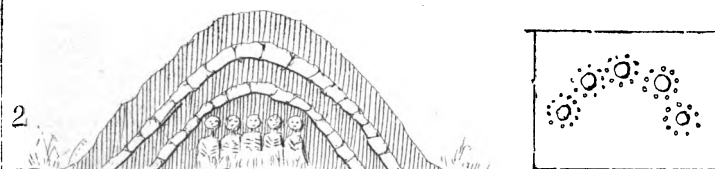
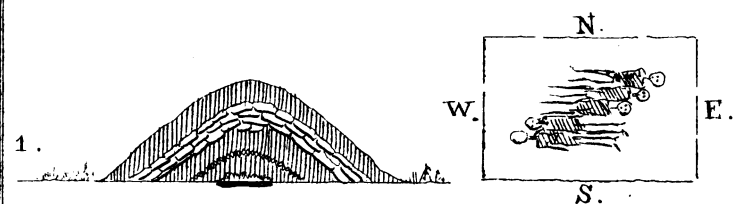
Lower figure, stone pipe No. 5....." 11



LITHA HAGERDORF

W.H. PRATT, SURVEYED

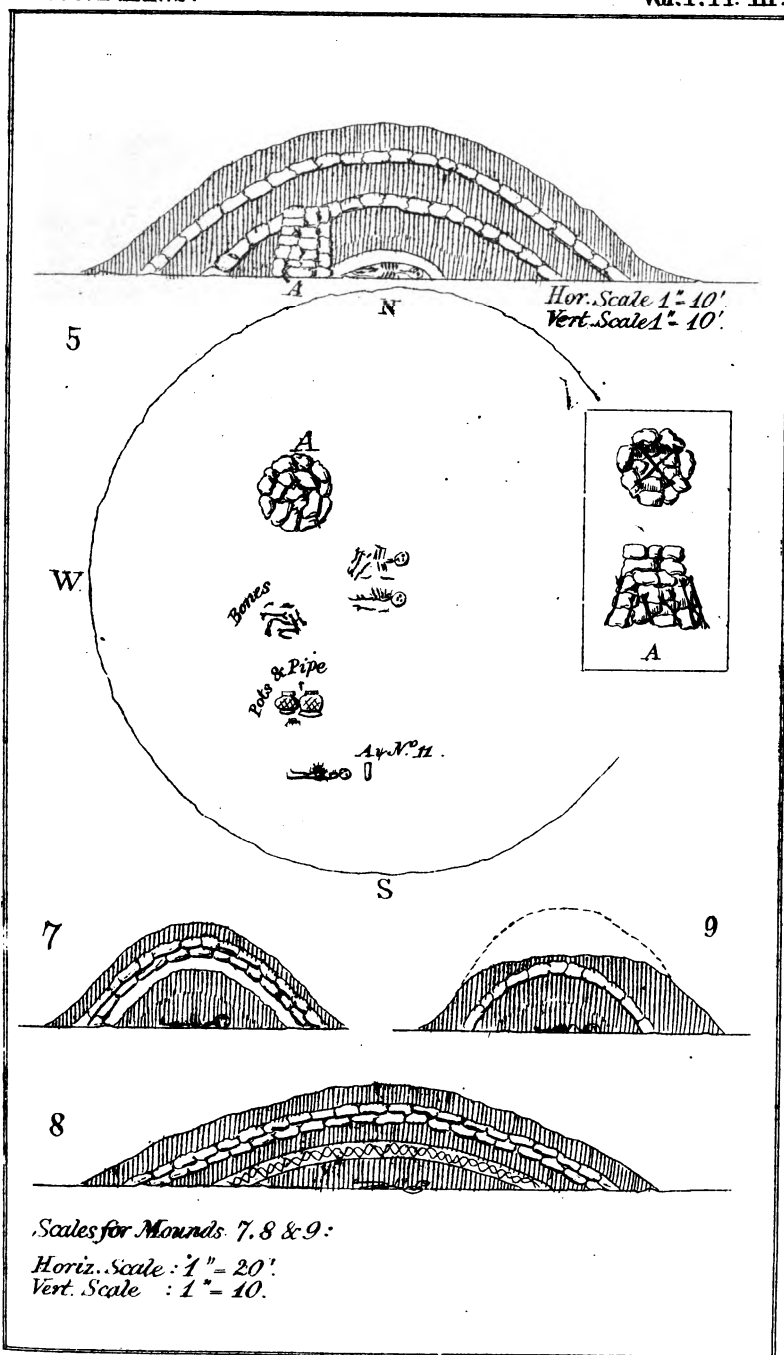
W. GORDON, DEL.



Horiz.^l scale: 1 in = 20 feet.
Vertical scale: 1 in = 10 feet.

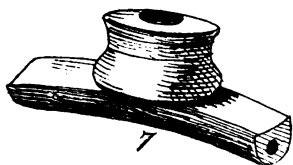
Legend.

	<u>Earth</u>
	<u>Straw</u>
	<u>Shells</u>
	<u>Ashes</u>
	<u>Clay</u>

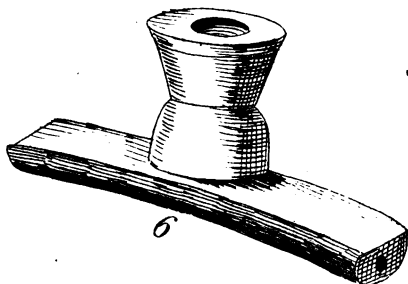


W.O. Gronen, Delt.

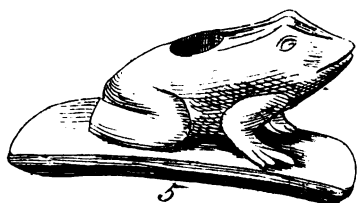
A. Hagdoeck, Lith.



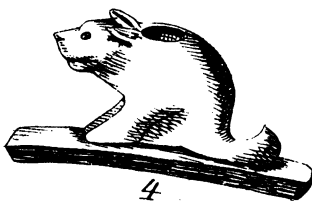
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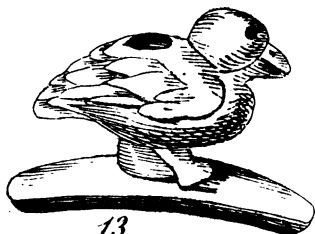
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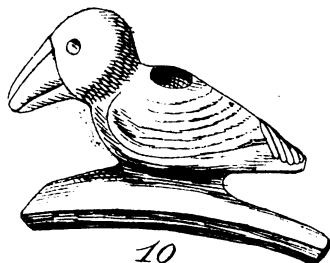
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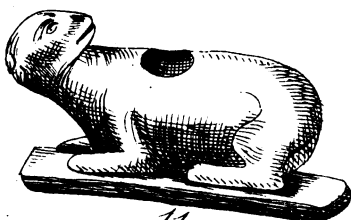
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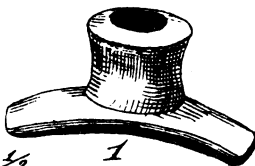
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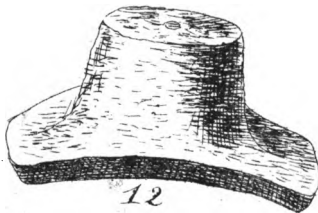
14



11



1

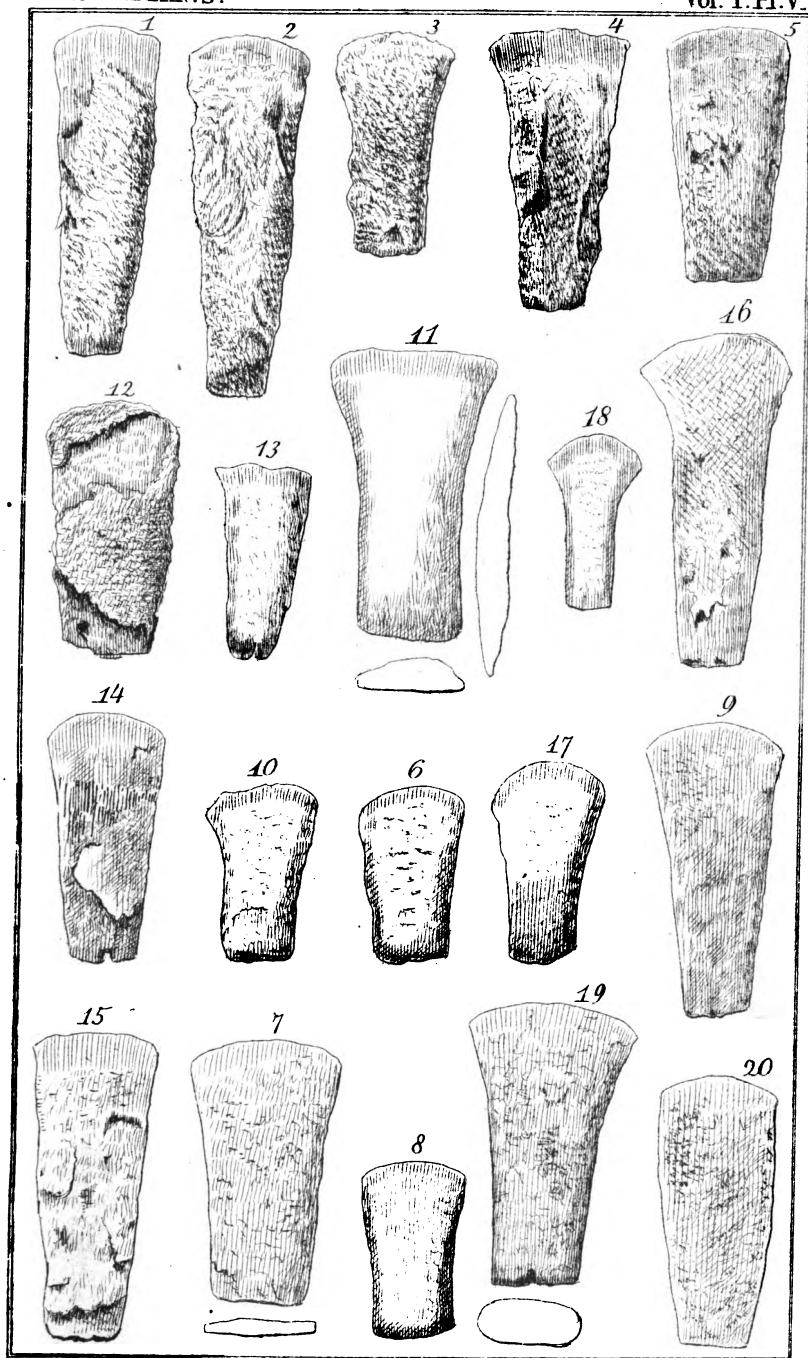


12

Scale $\frac{1}{2}$

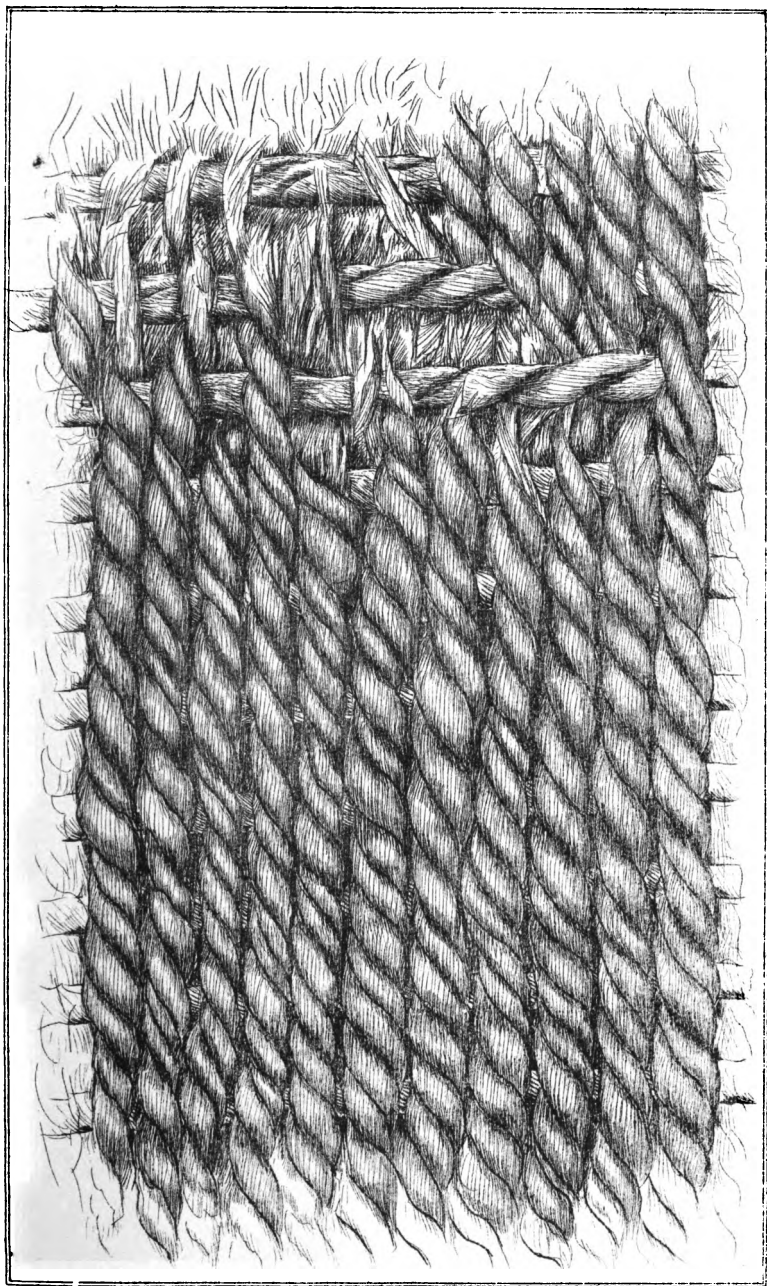
W. H. Pratt, Del.

A. Hagebeck, Lith.



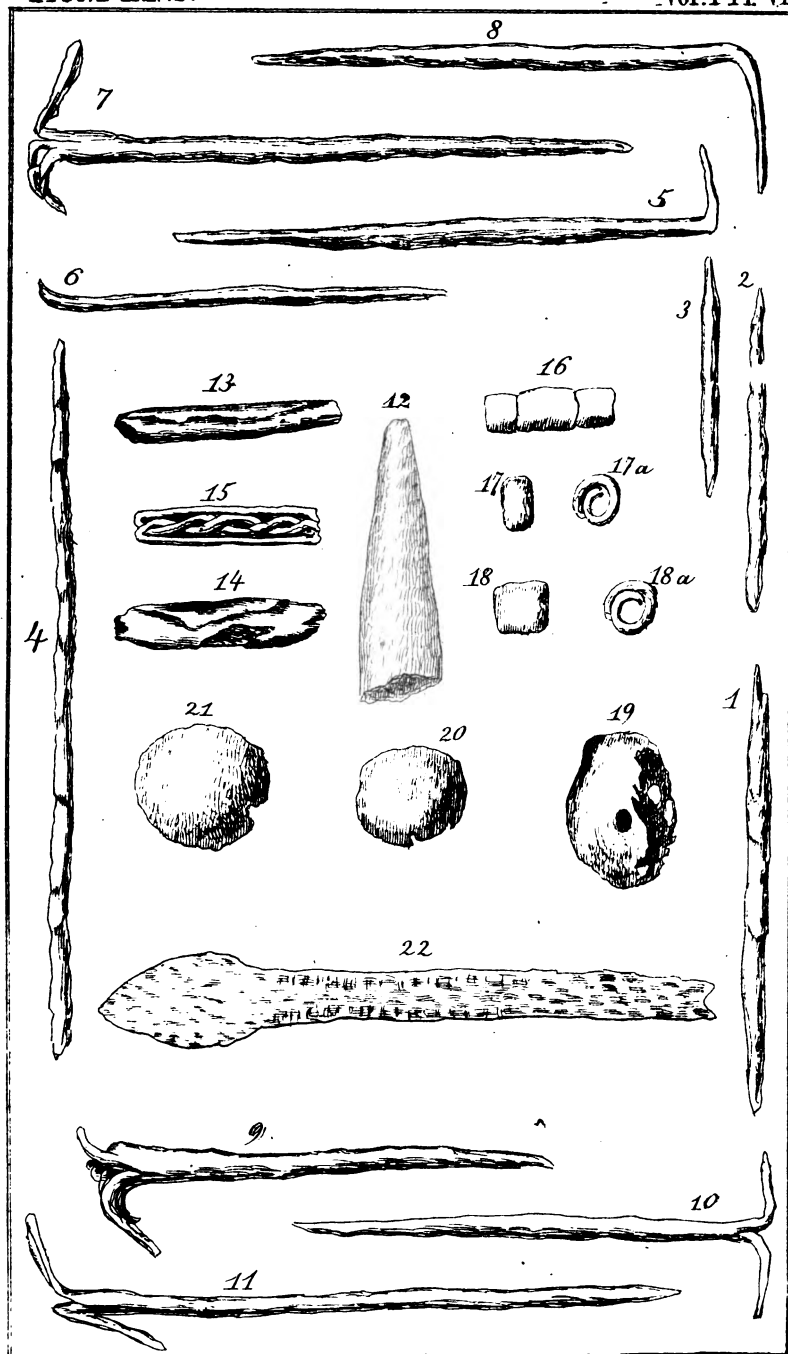
W. H. Pratt, Del.

A. Hawke, Lith.



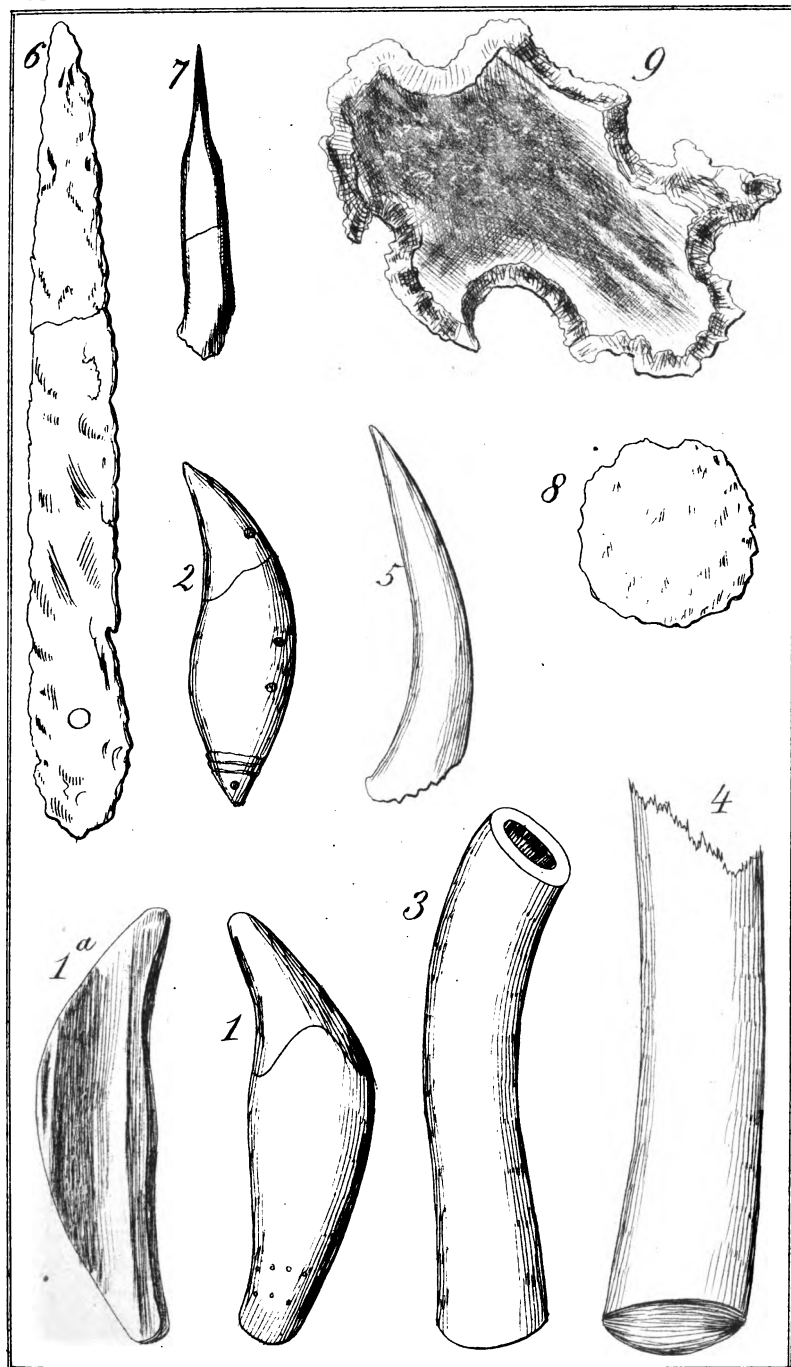
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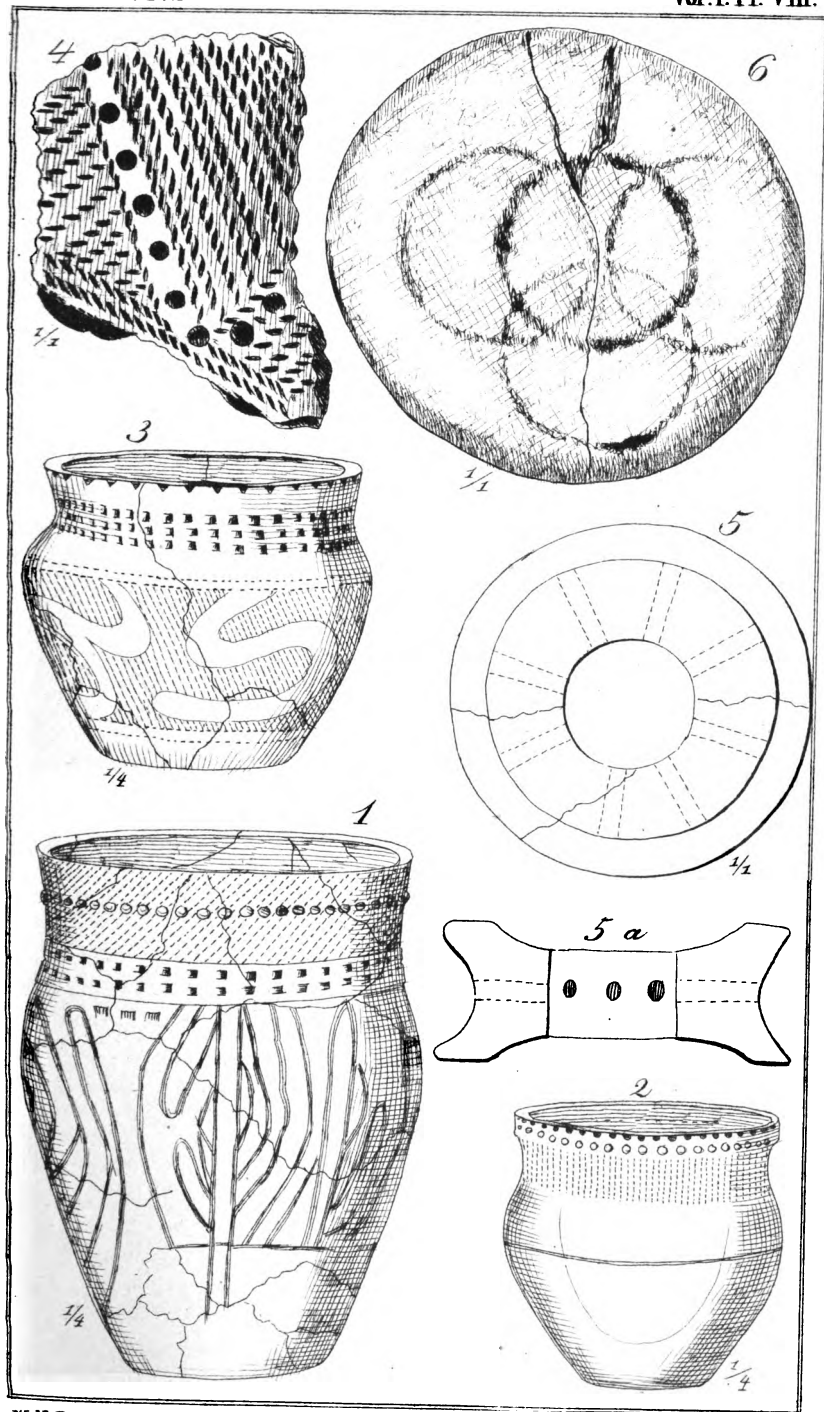
Lith. A. Hagedorn.



W. H. Pratt, Del.

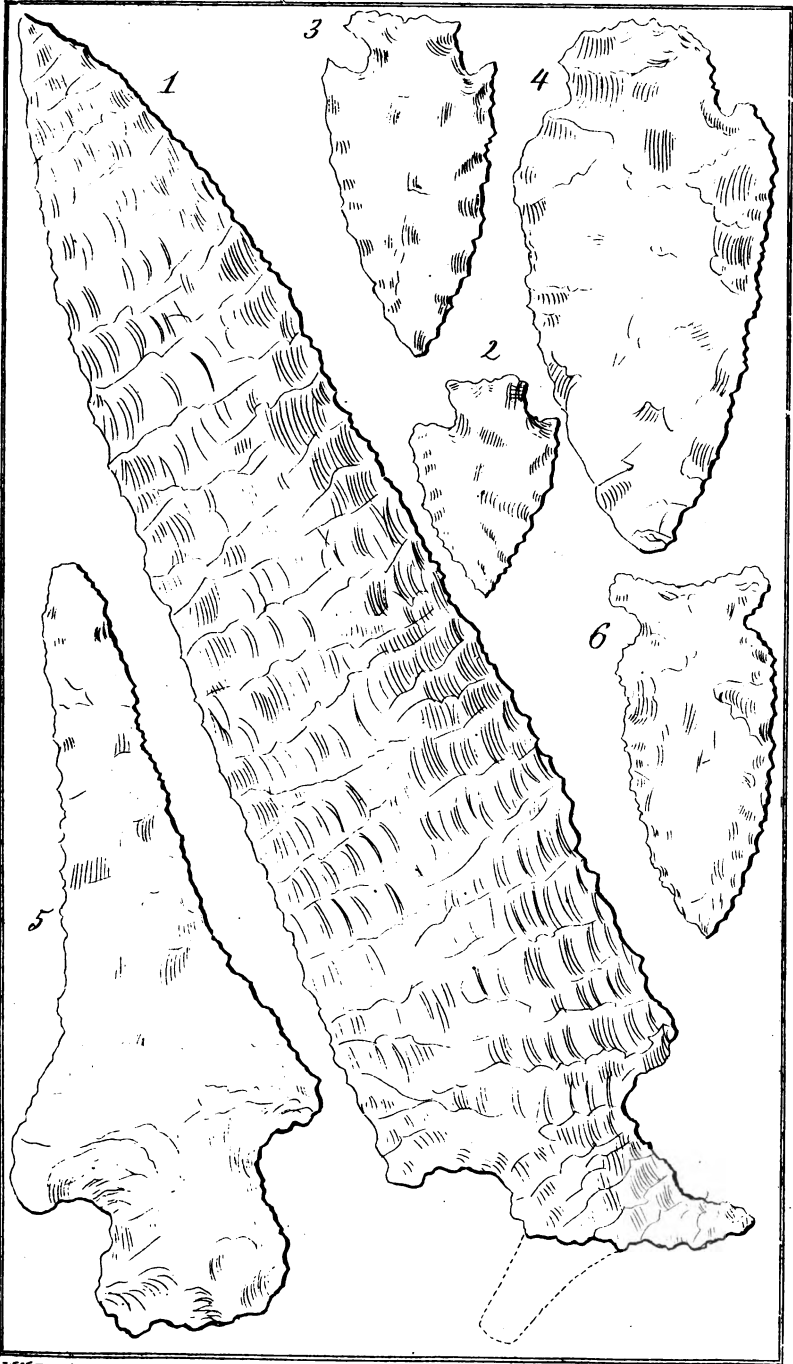
A. Hagedoek, Lith.





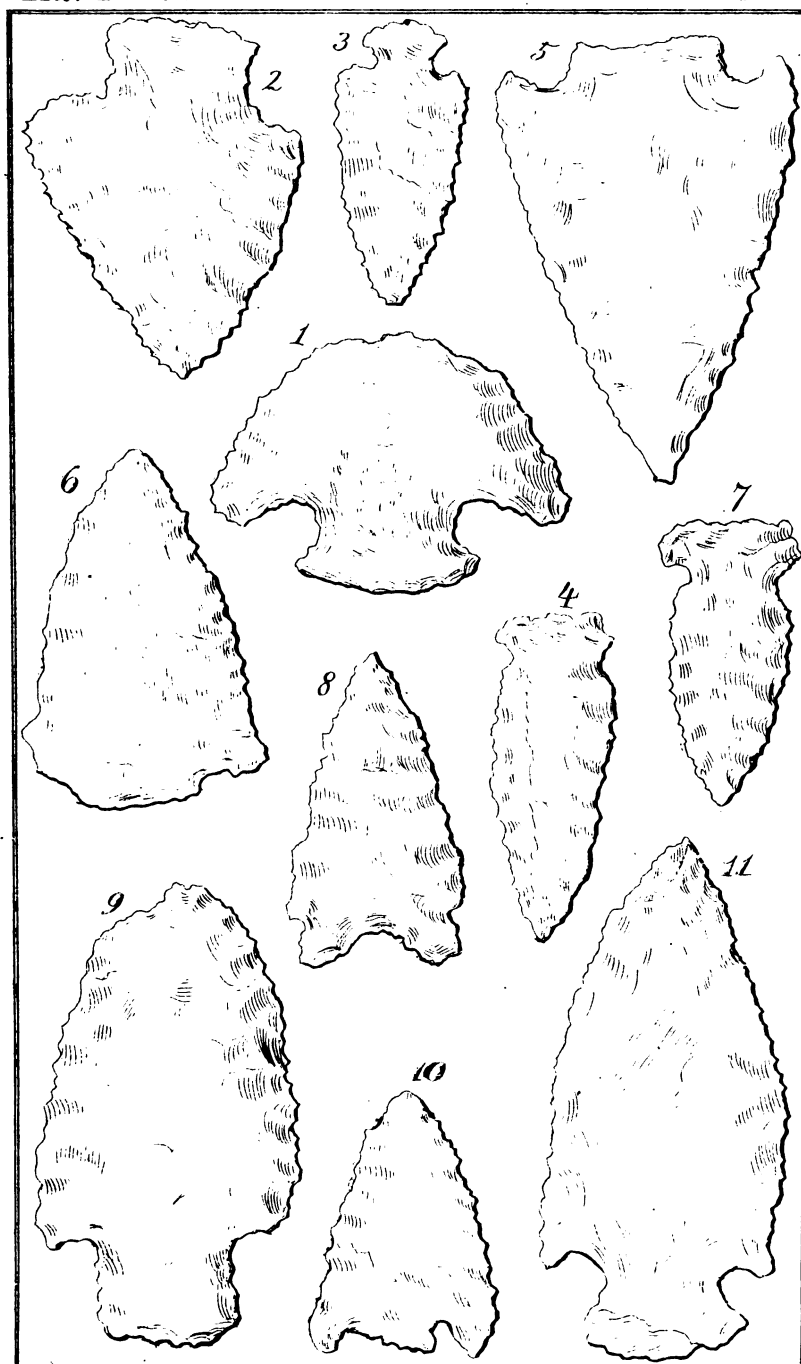
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A. Hagedorn, Lith.



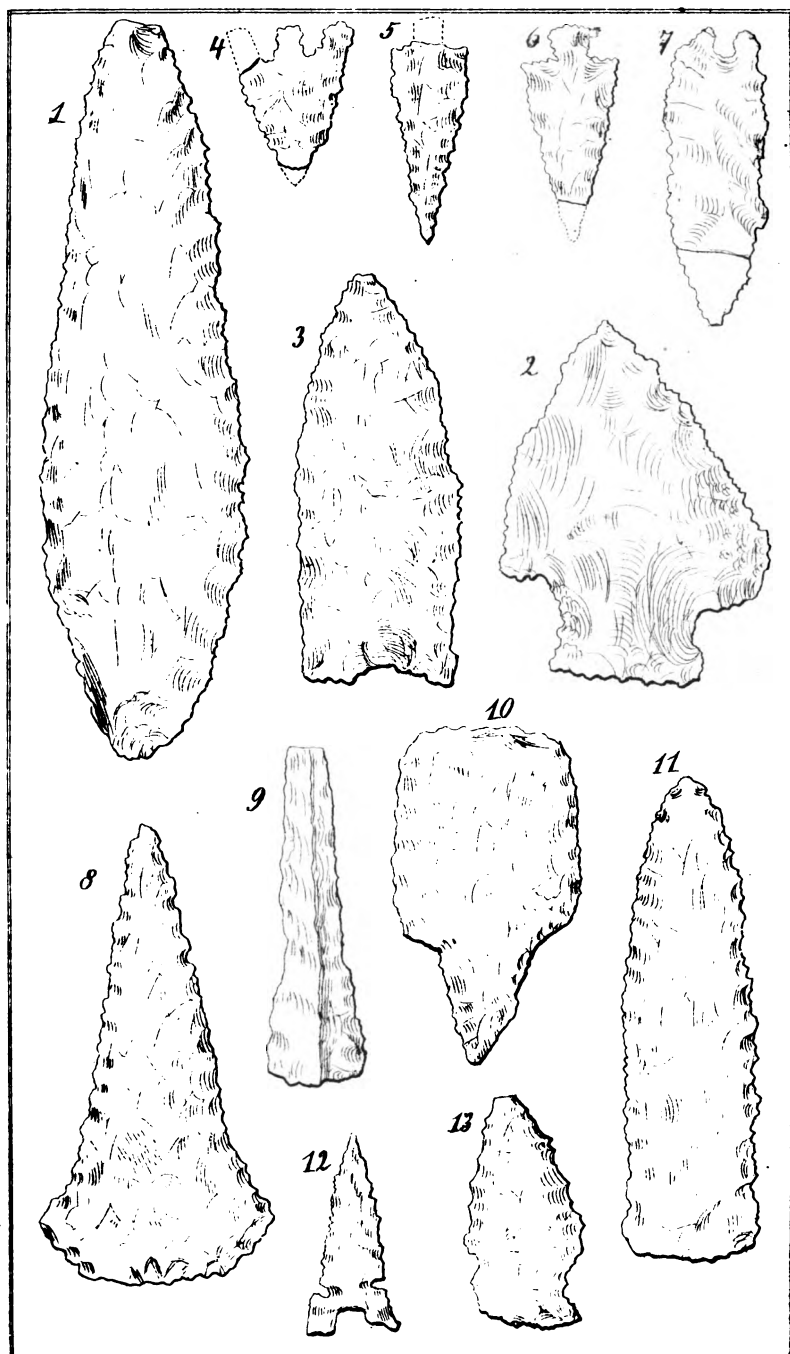
W.H. Pratt, Del.

Litho A. Hagedoorn



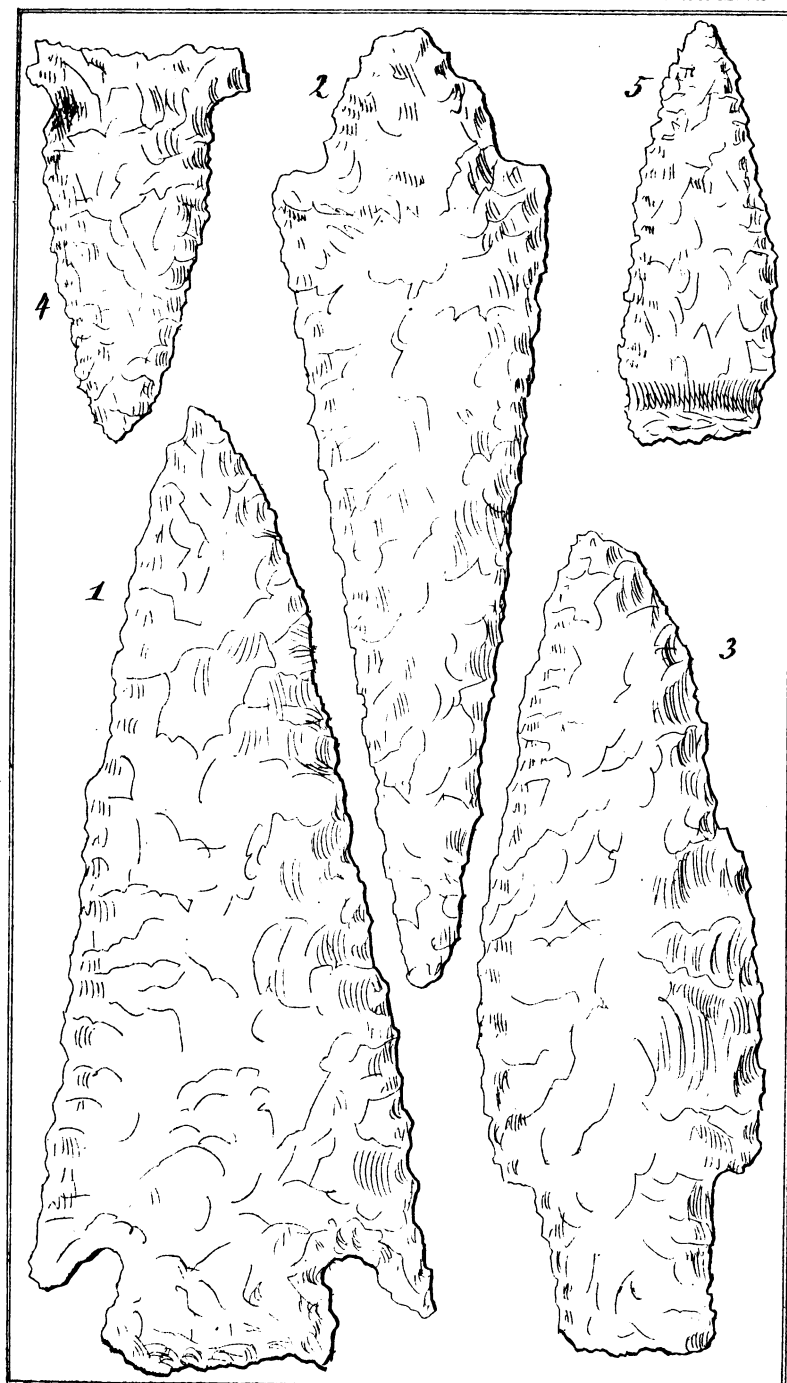
W. H. Pratt, Del.

A. Hagedorn, Lith.



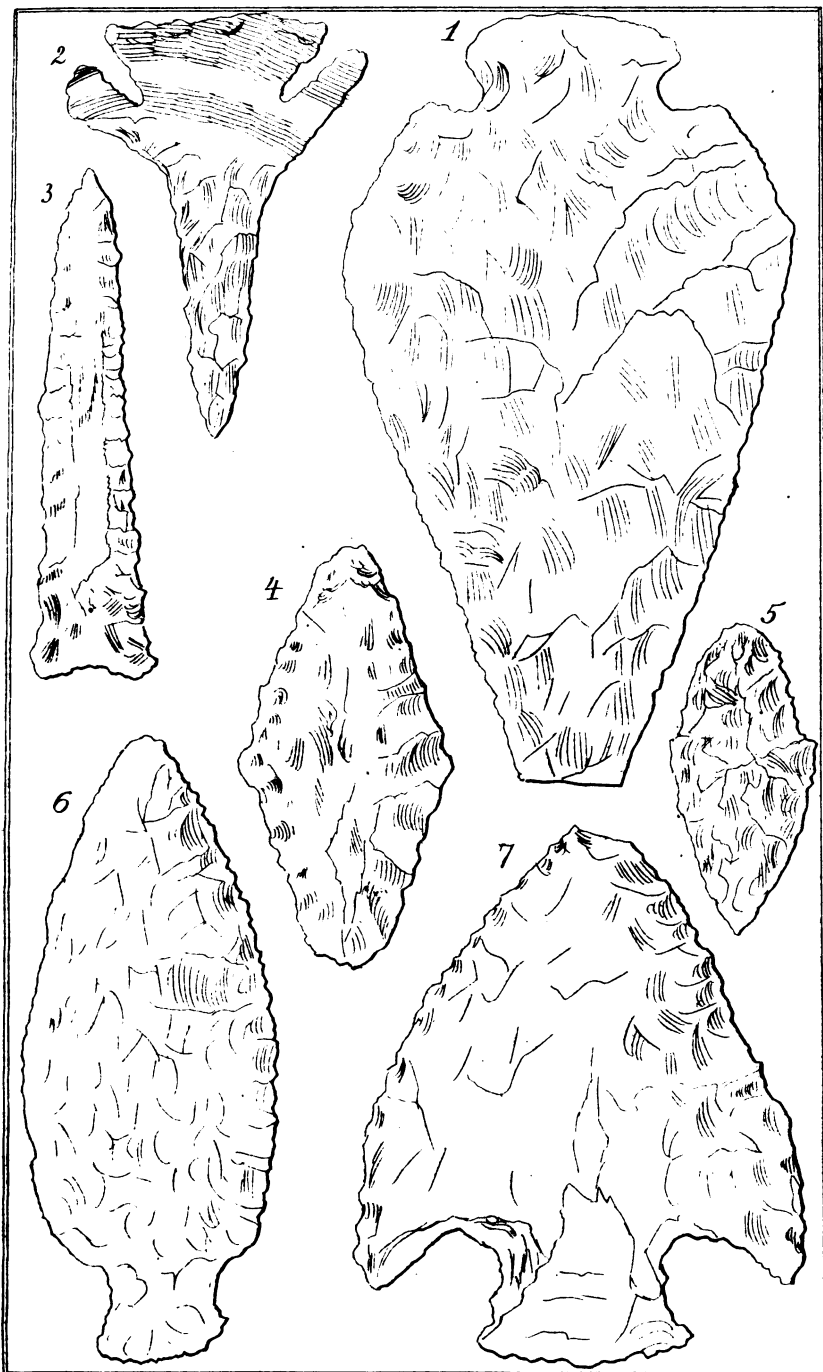
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A. Engelbrecht Lith.



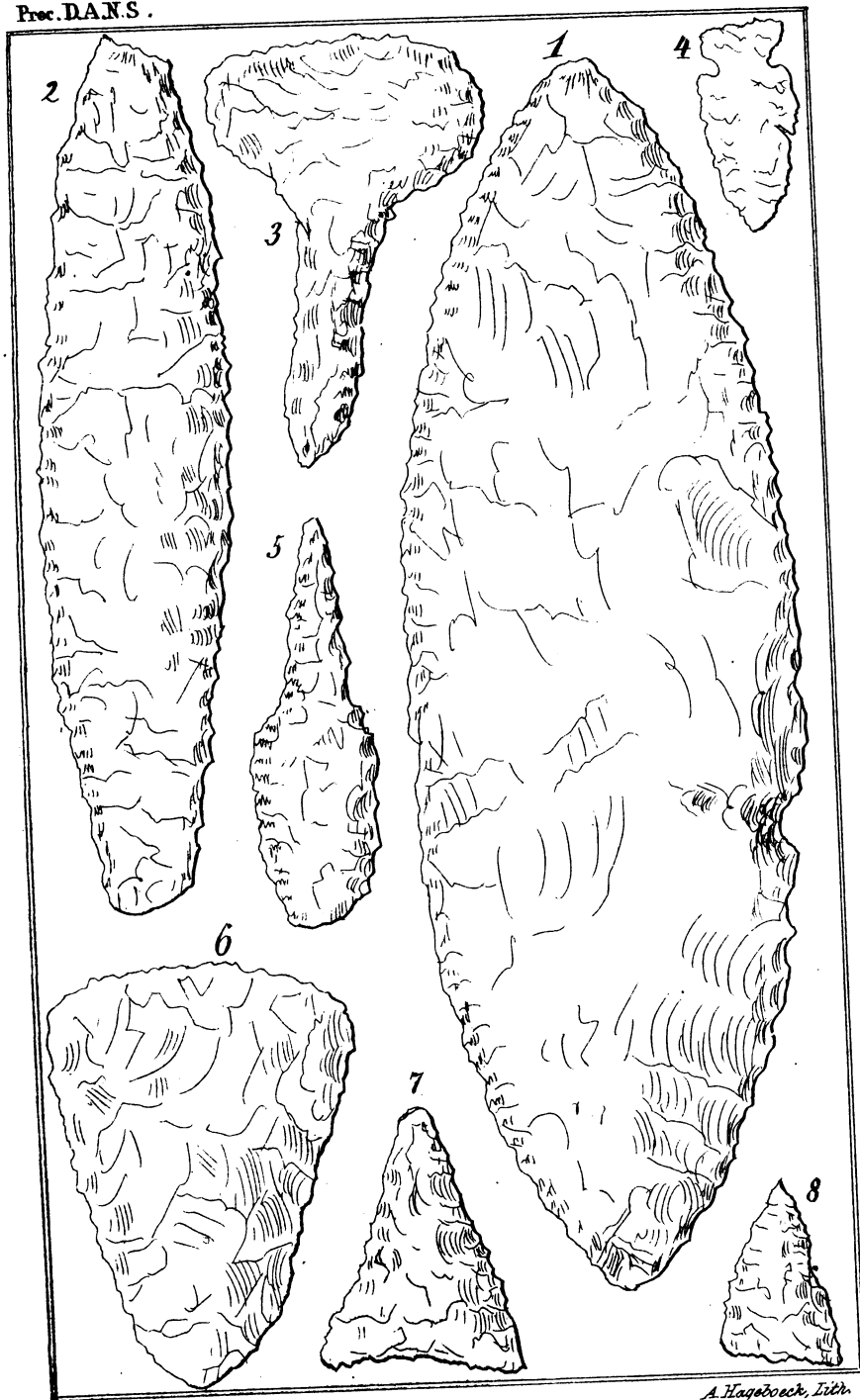
W H Pratt, Del.

A Hagedorn, Lith.



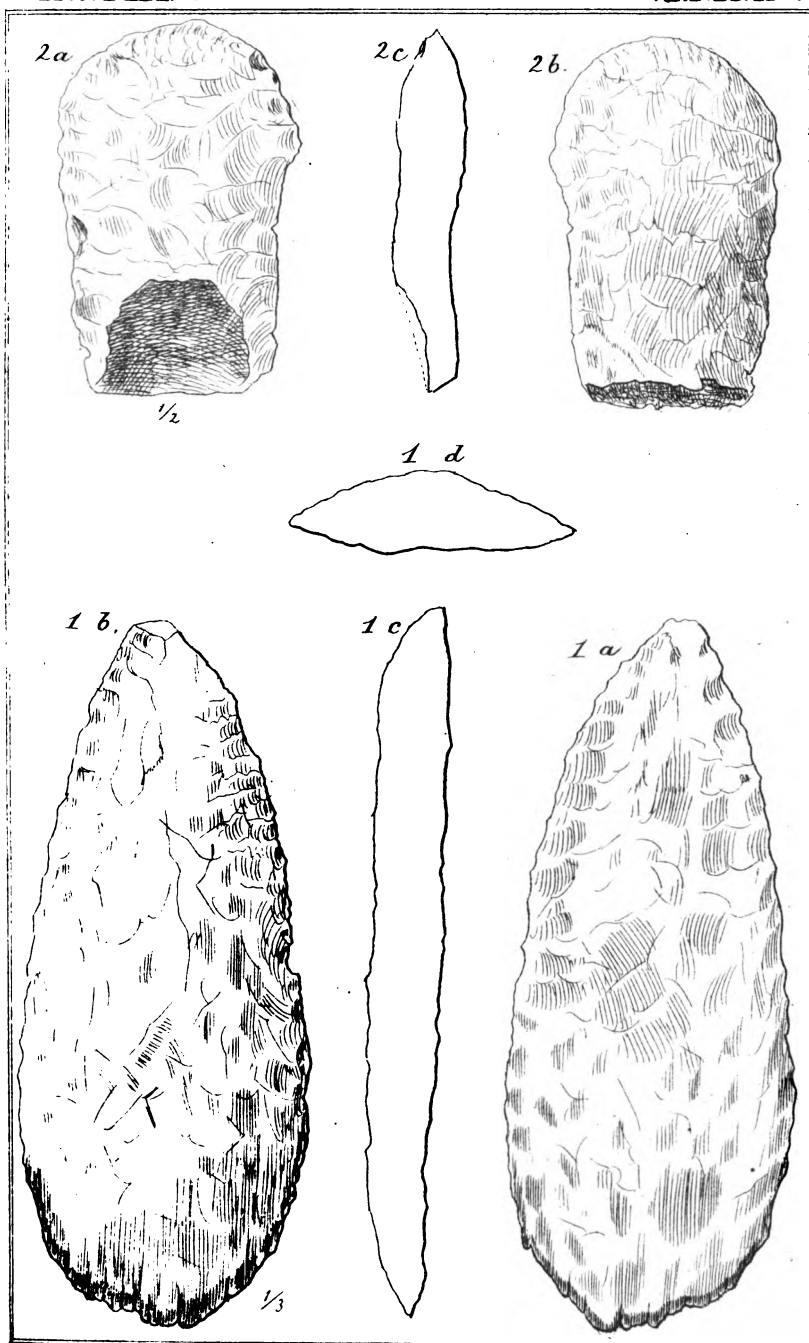
W. H. Pratt, Del.

A. Hageboeck, Lith.



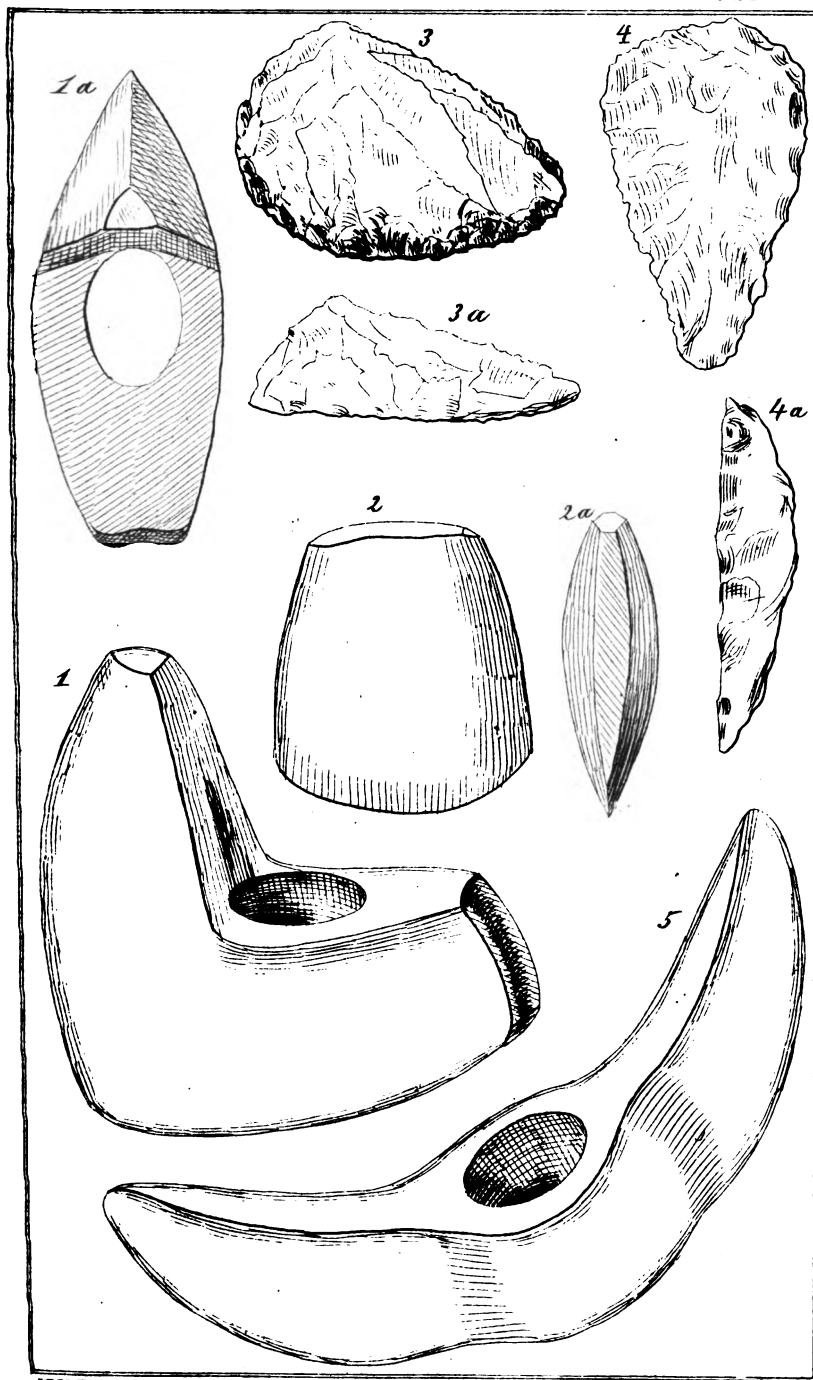
W.H. Pratt, Del.

A. Hagobrock, Lith.



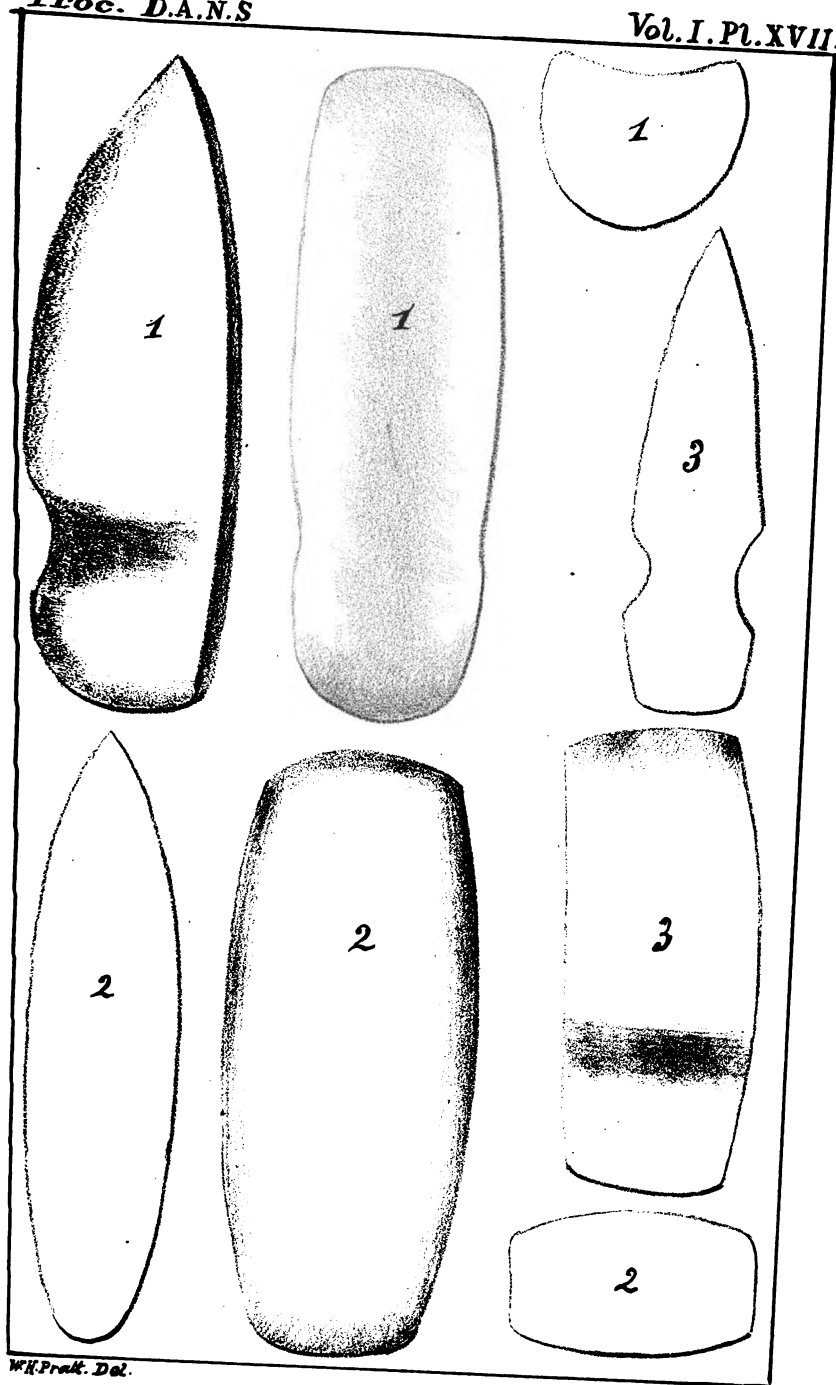
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A. Hagerbeck, Lith.



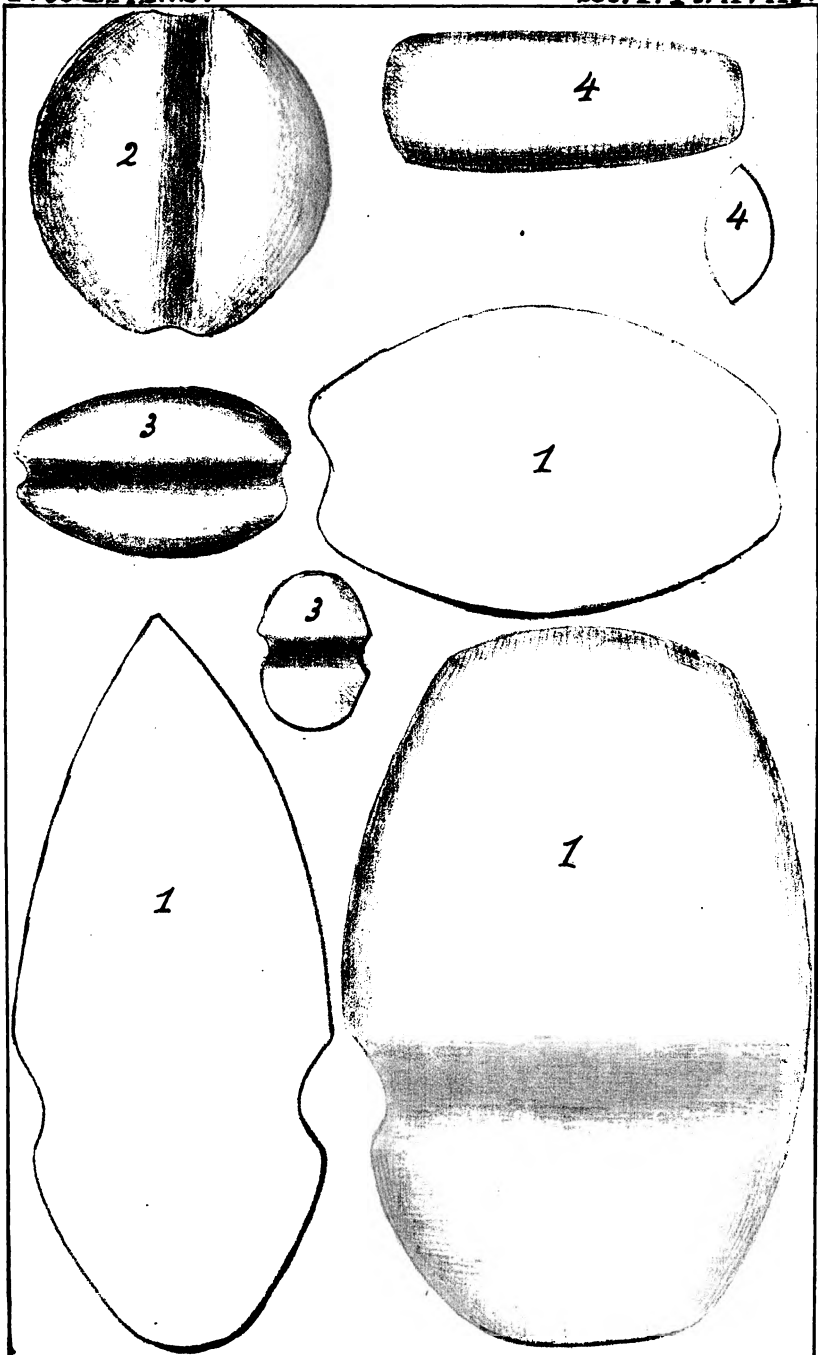
W.H. Pratt, Des.

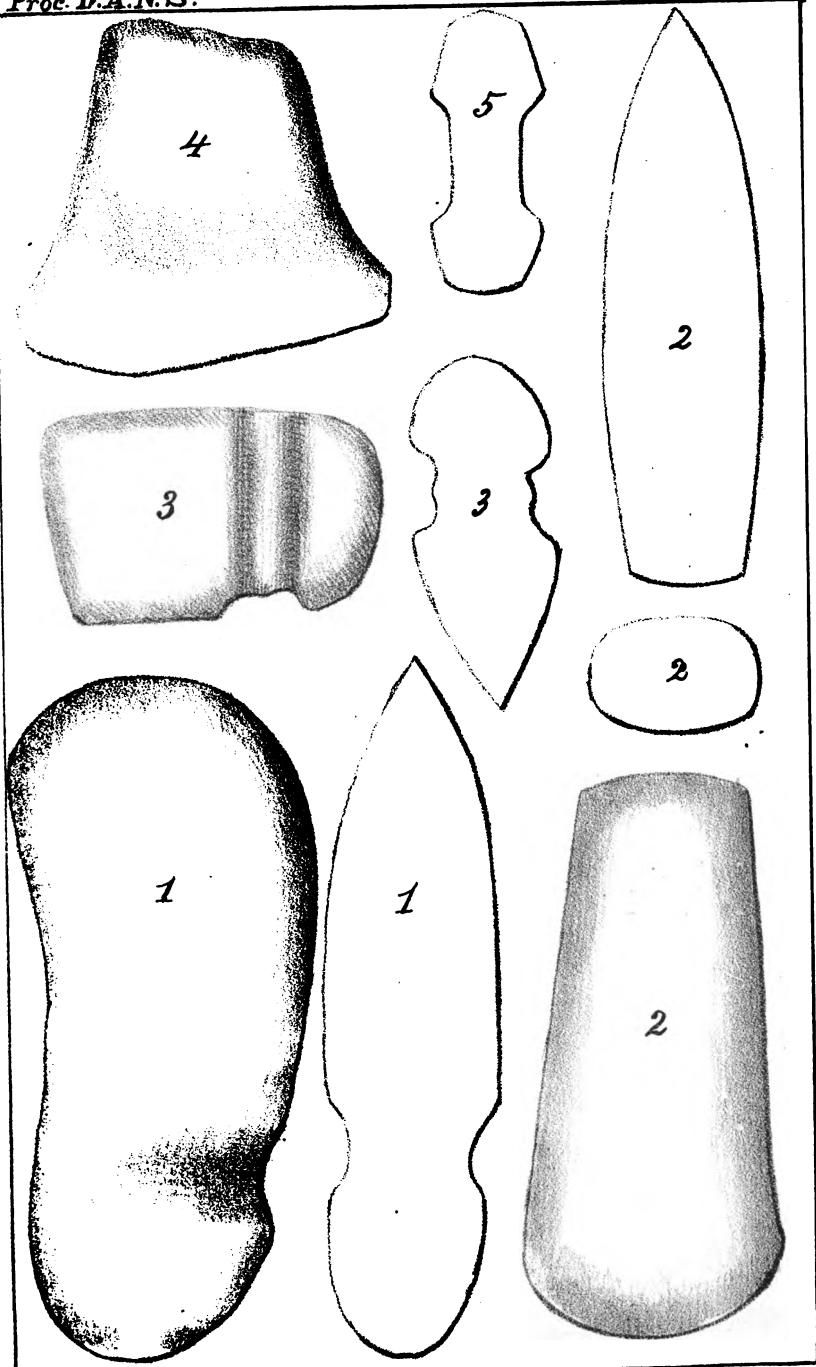
A. Haycock, Lith.

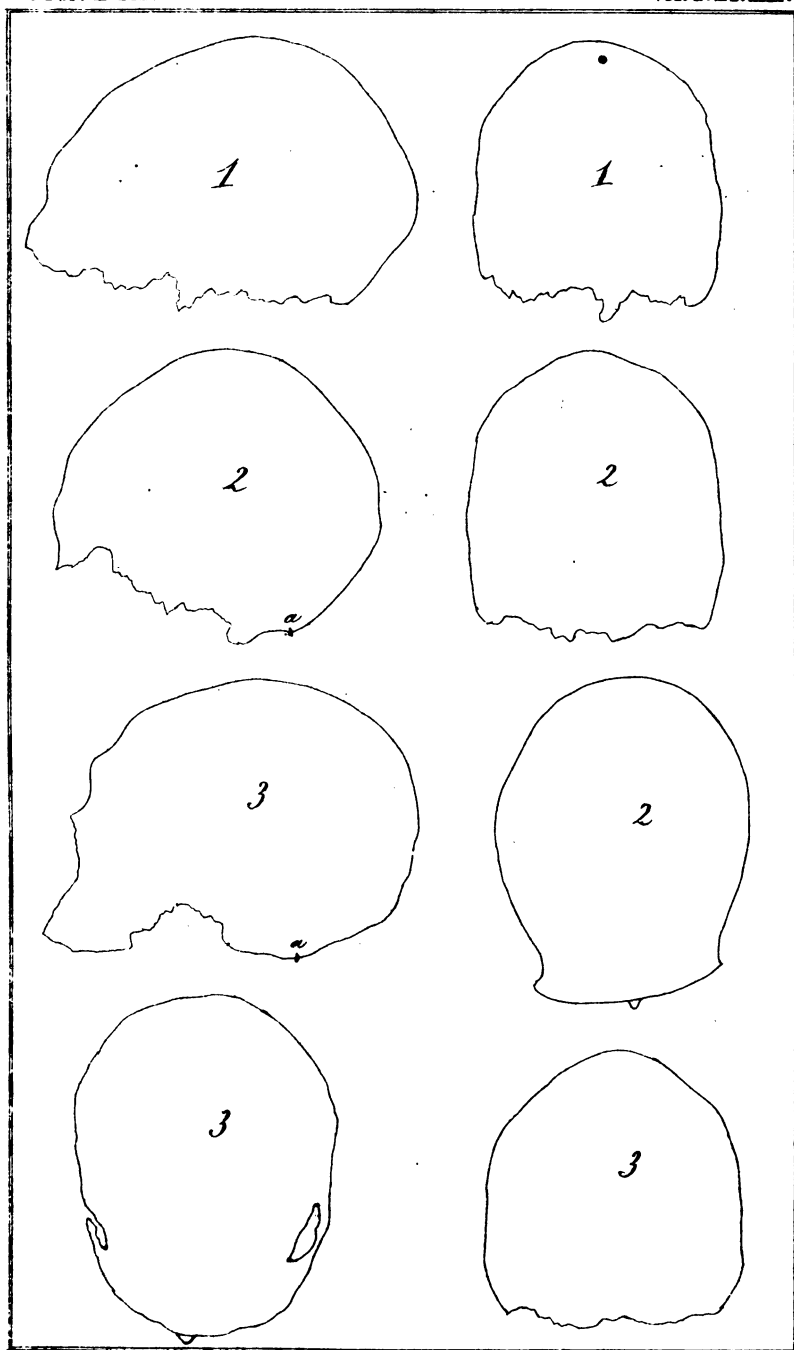


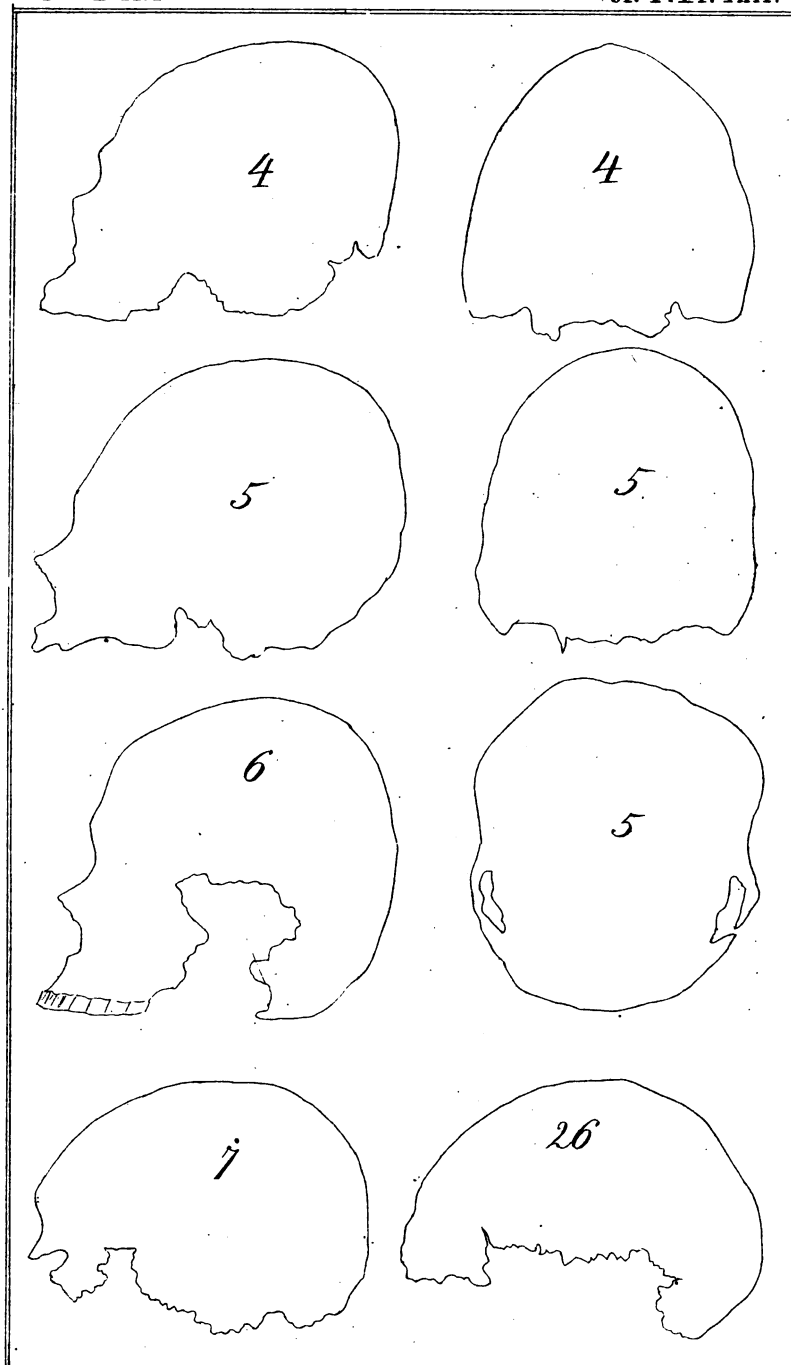
W.K. Prall. Del.

L. A. HAGEBOECK



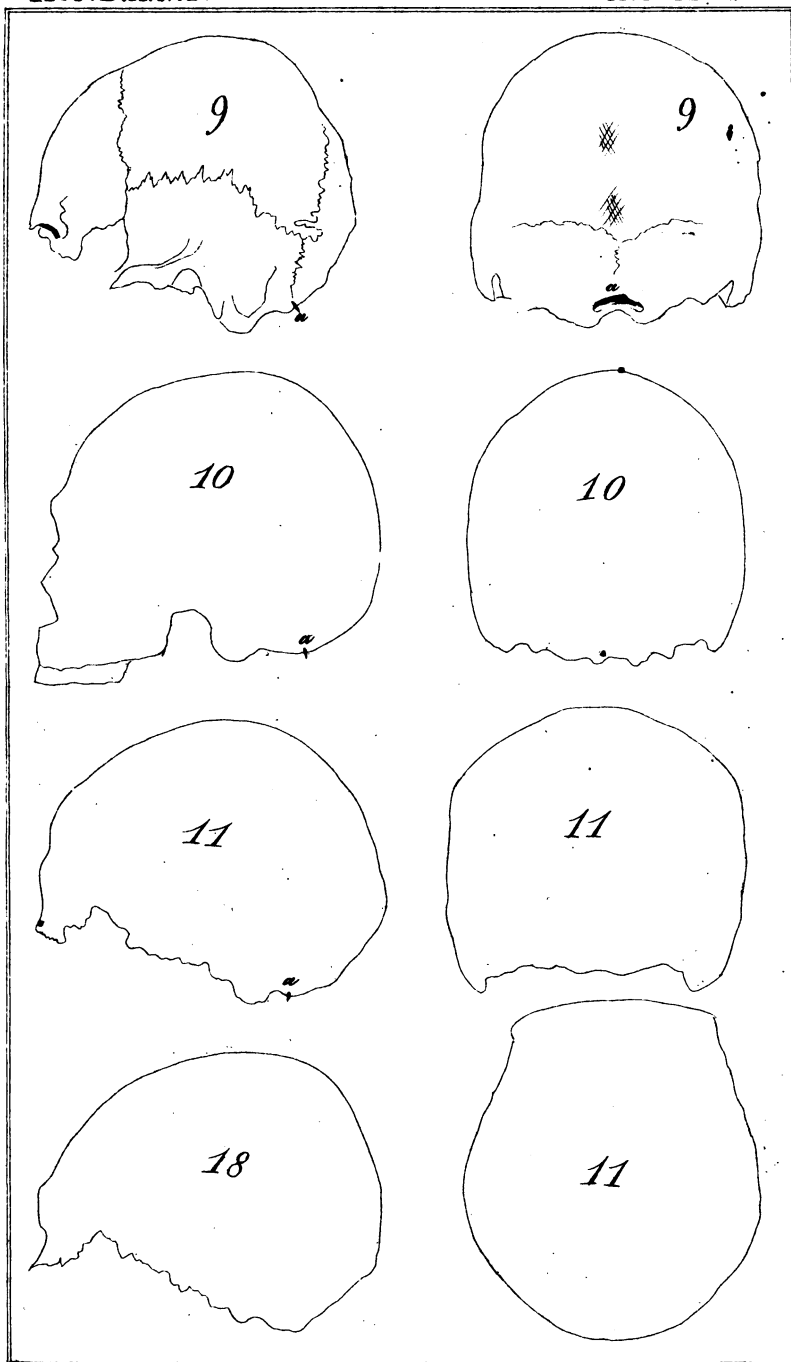


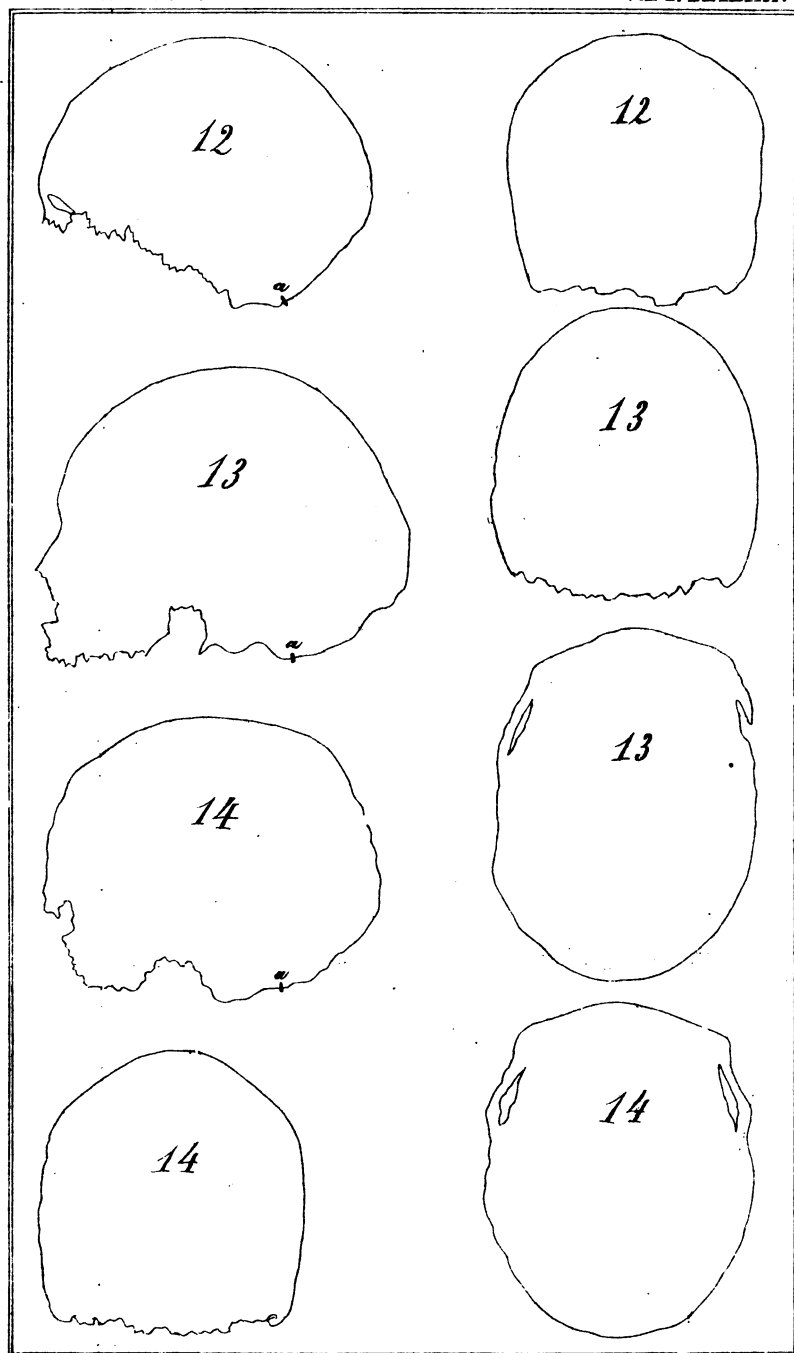




W.H. Pratt, Del.

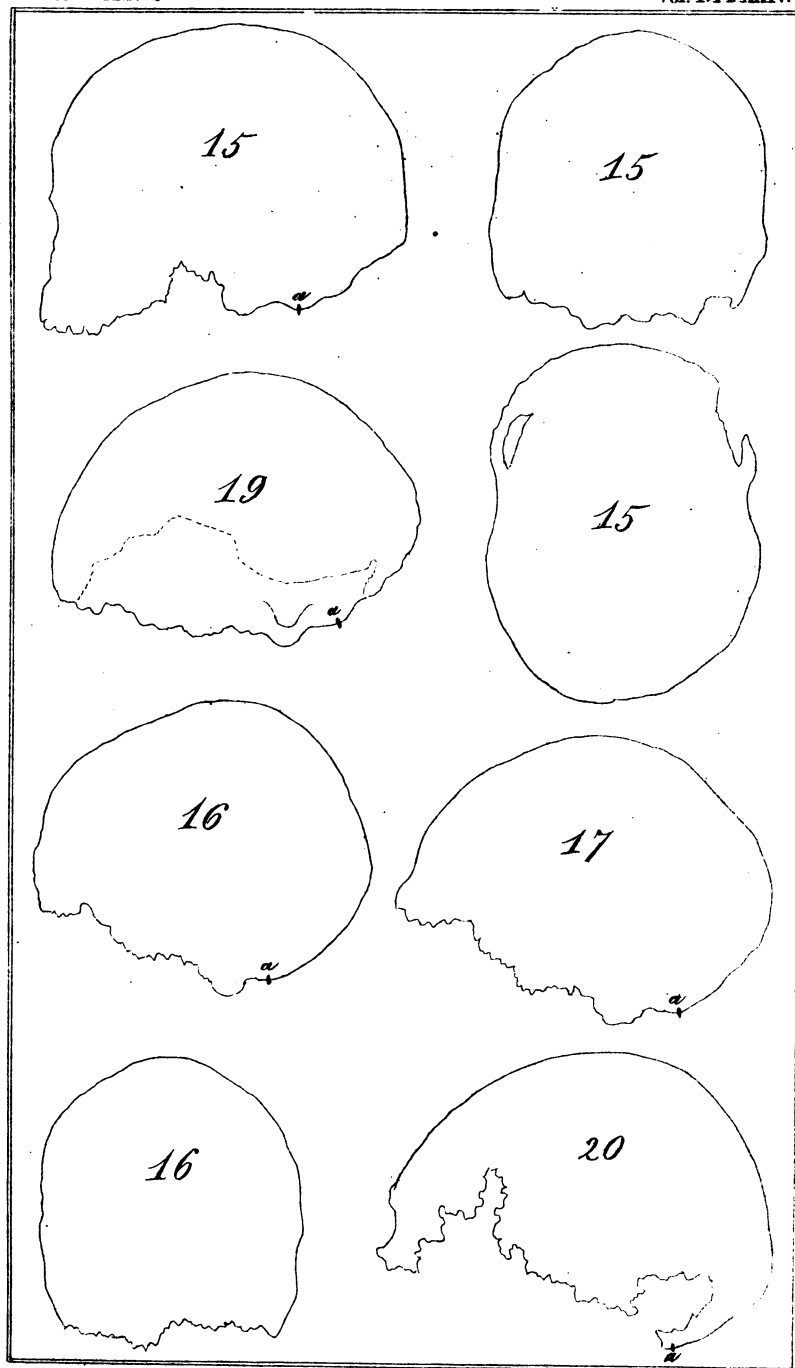
A. Hagedoorn, Lith.





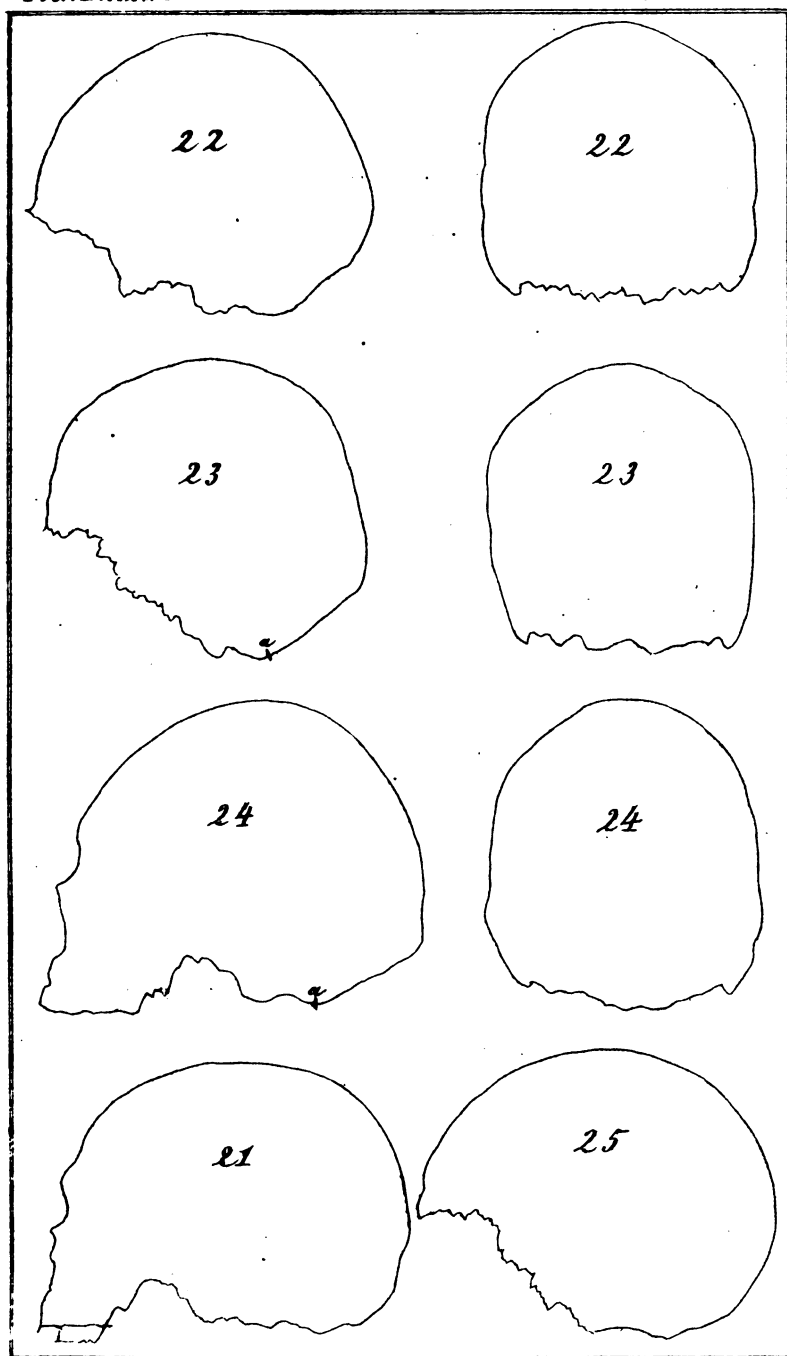
W. H. Pratt Del.

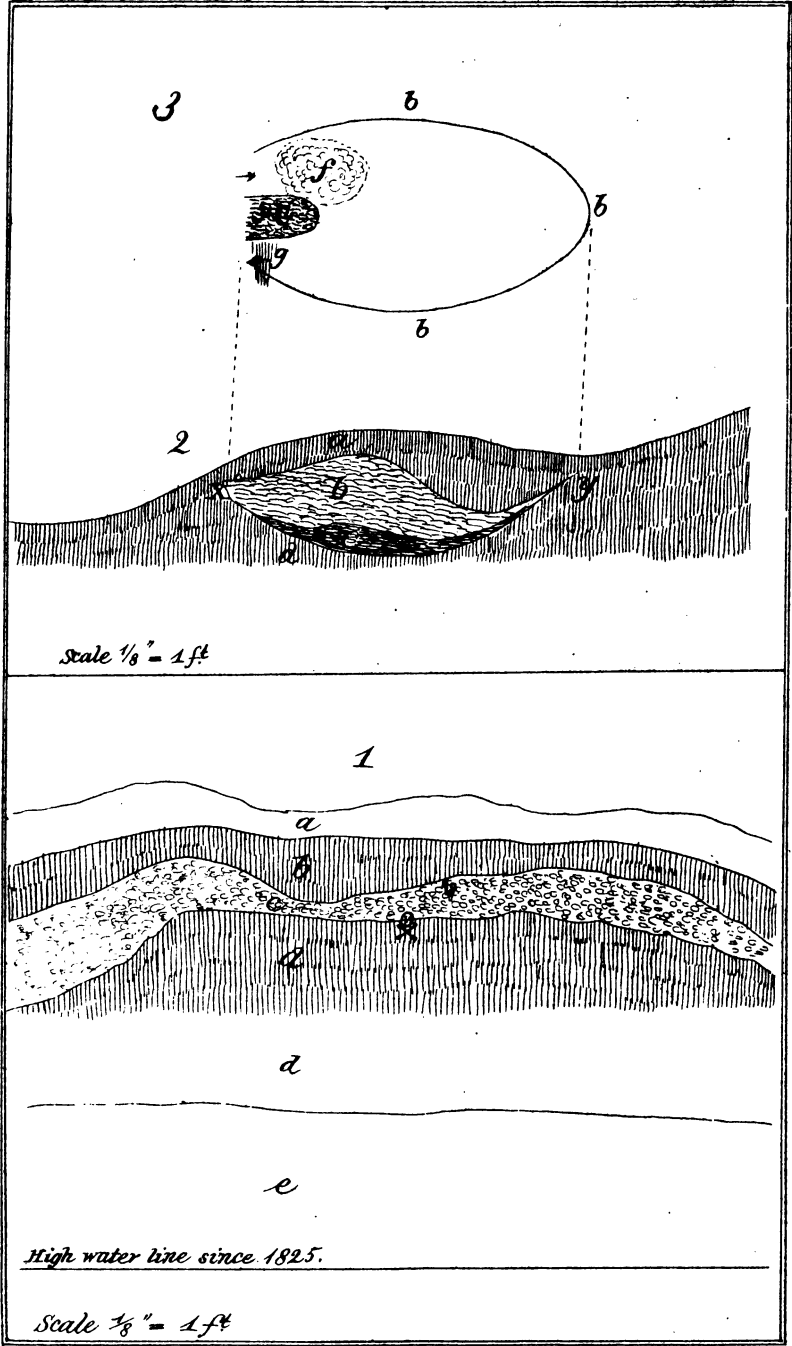
Lith. A. Hagedoorn.



W.H. Pratt, Del.

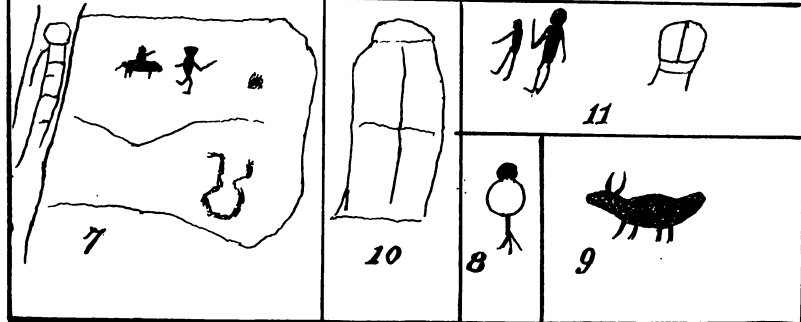
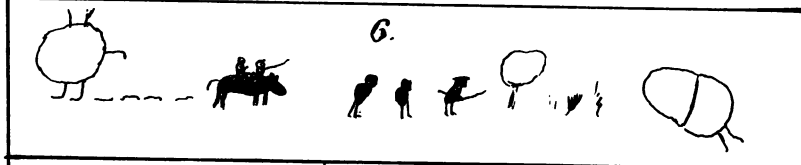
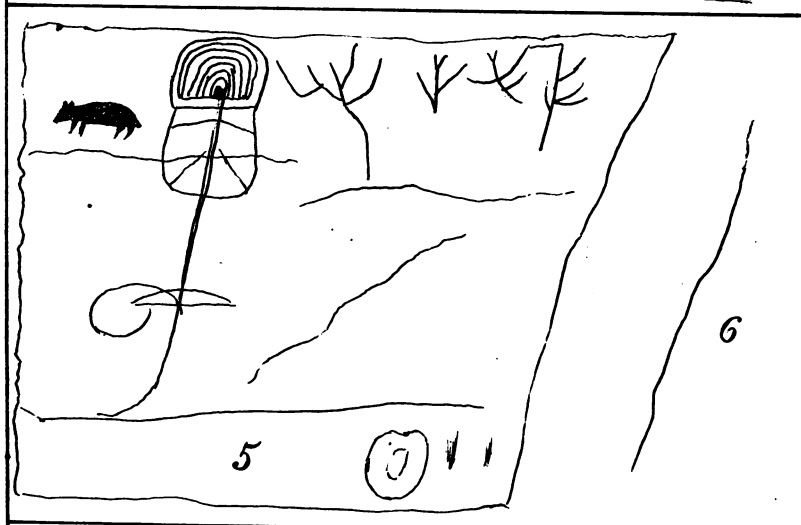
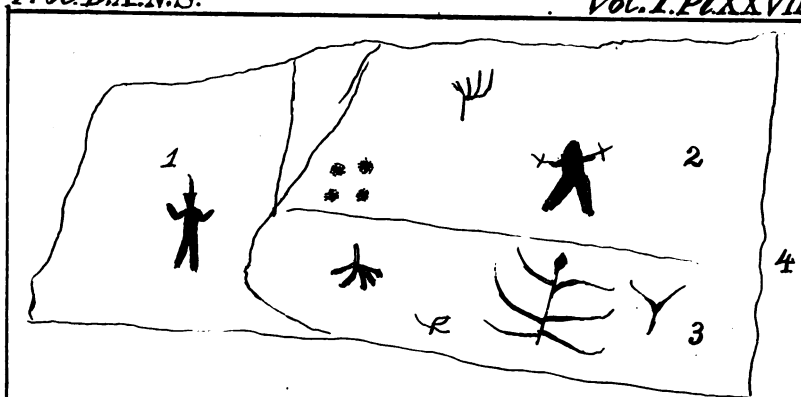
A. Hageboeck, Lith.

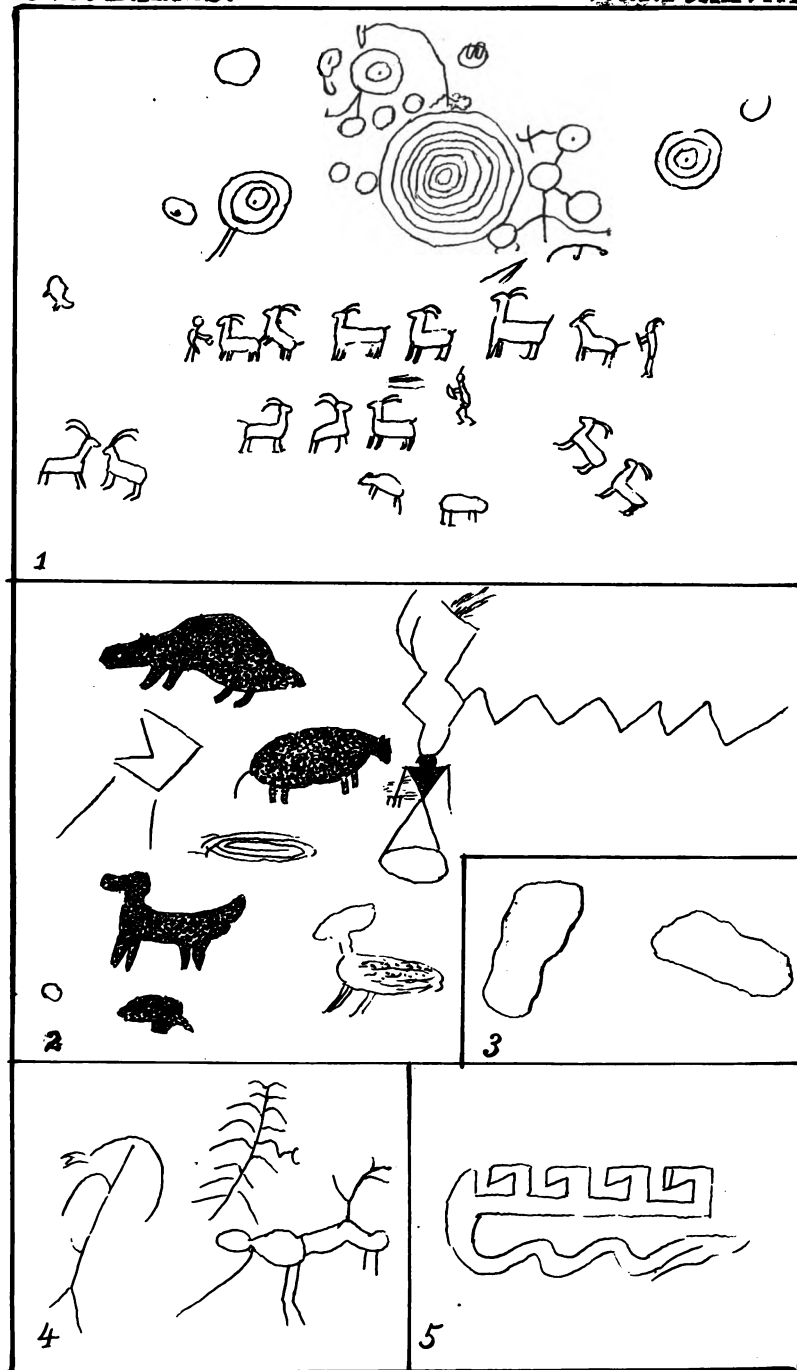




J.D. Putnam, Del.

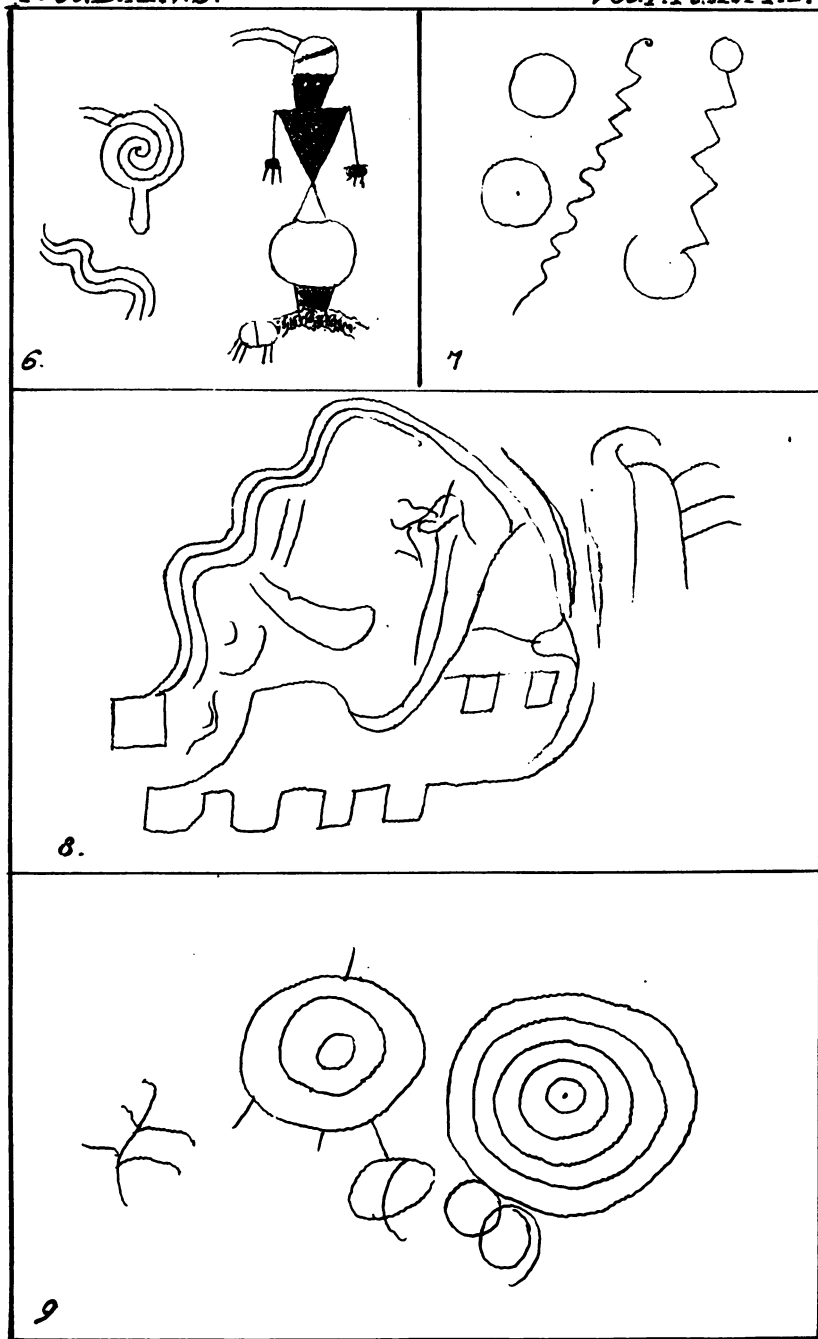
A. Hagboeck, Lith.





J. D. Putnam, Del.

Lith. A. Hageboeck.

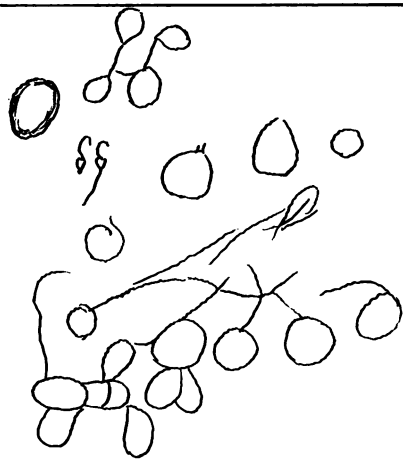


J. D. Putnam, Del.

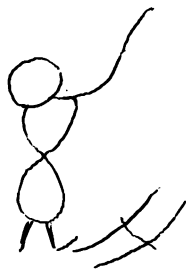
Lith. A. Hagedoorn.



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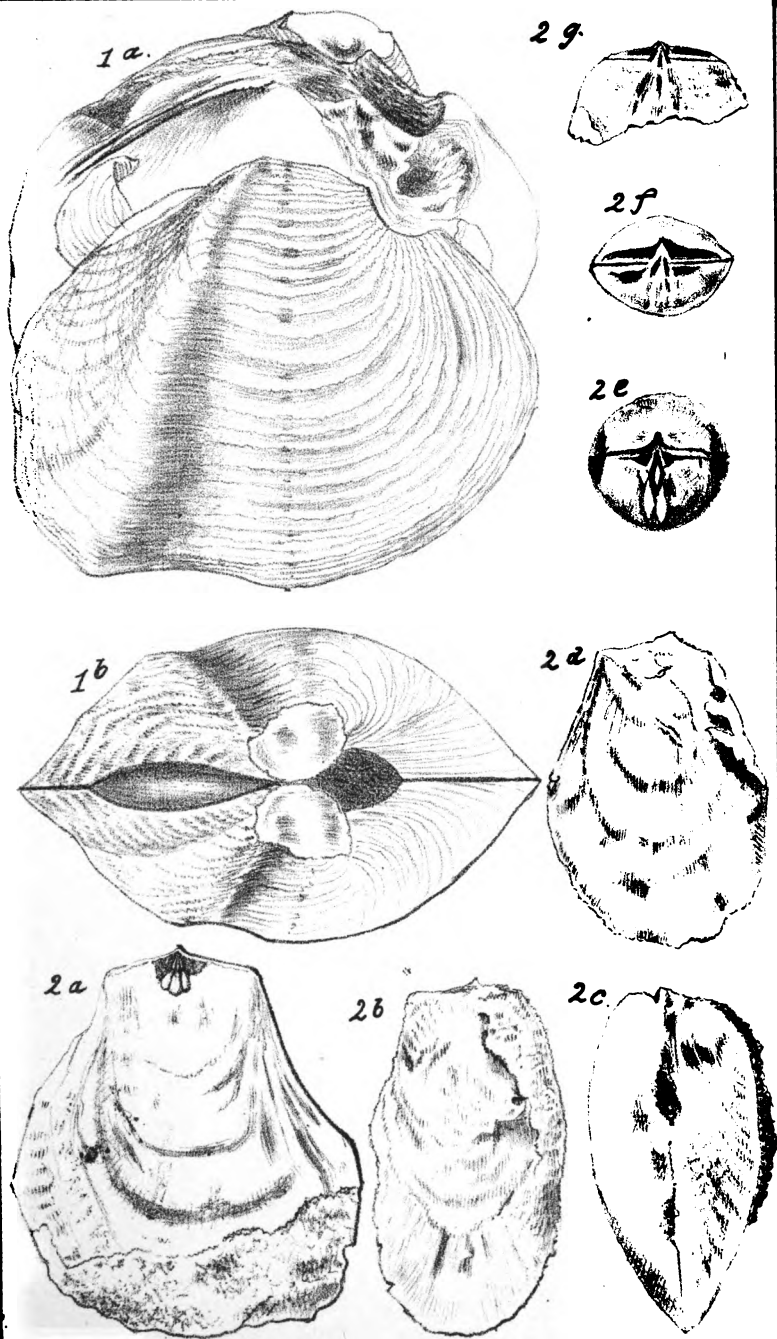
16



17

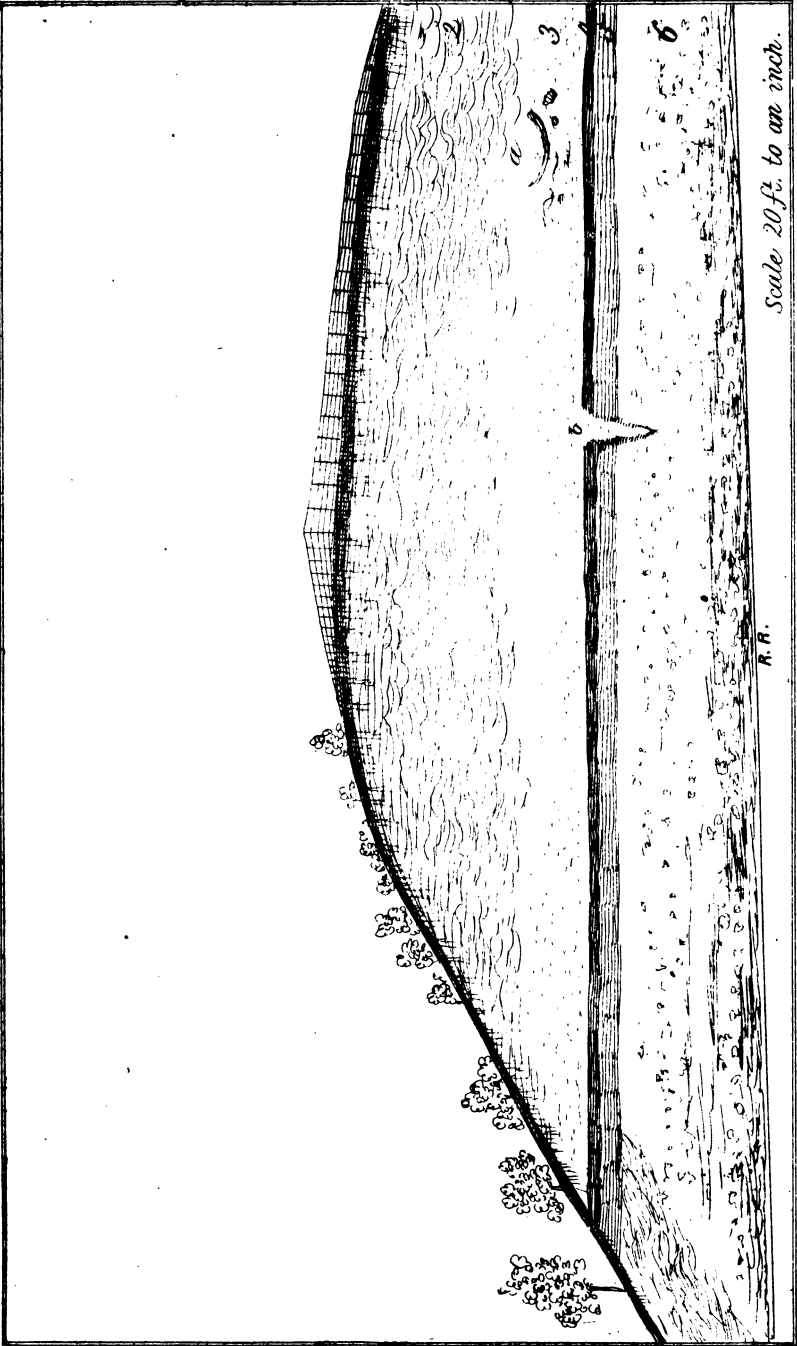
J. R. Pulnam, Del.

Lith. A. Hageboeck.



W. H. Pratt, Del.

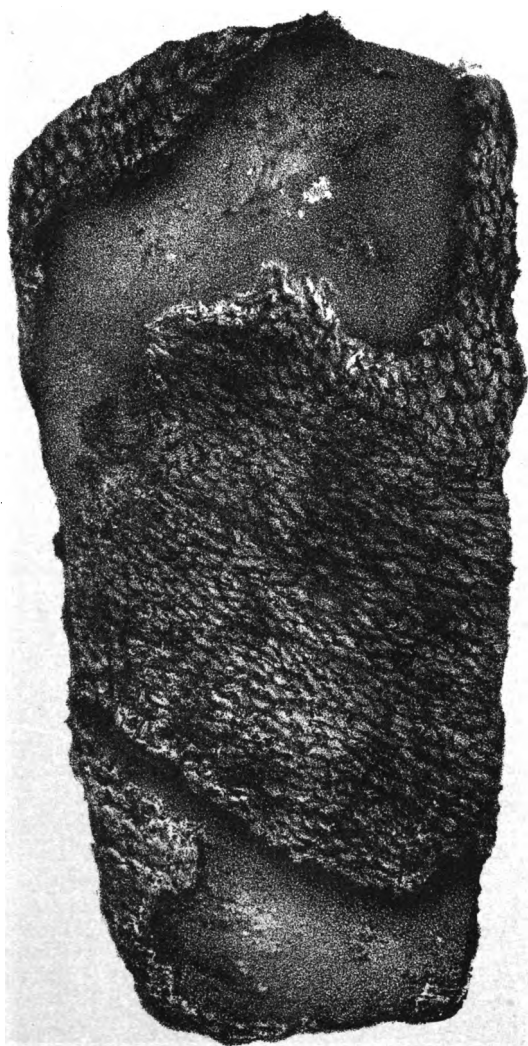
Lith. A. HAGEBOECK.



Scale 20 ft. to an inch.

A. Hagedorn, Lith.

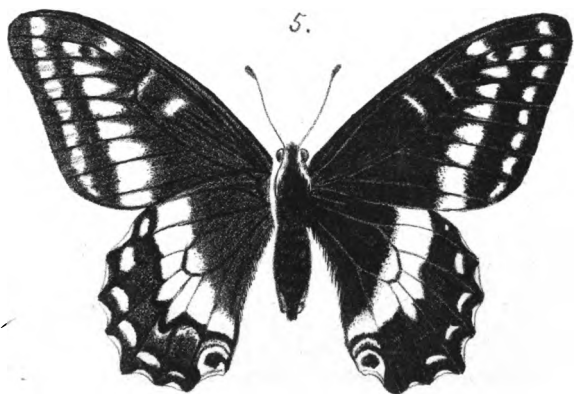
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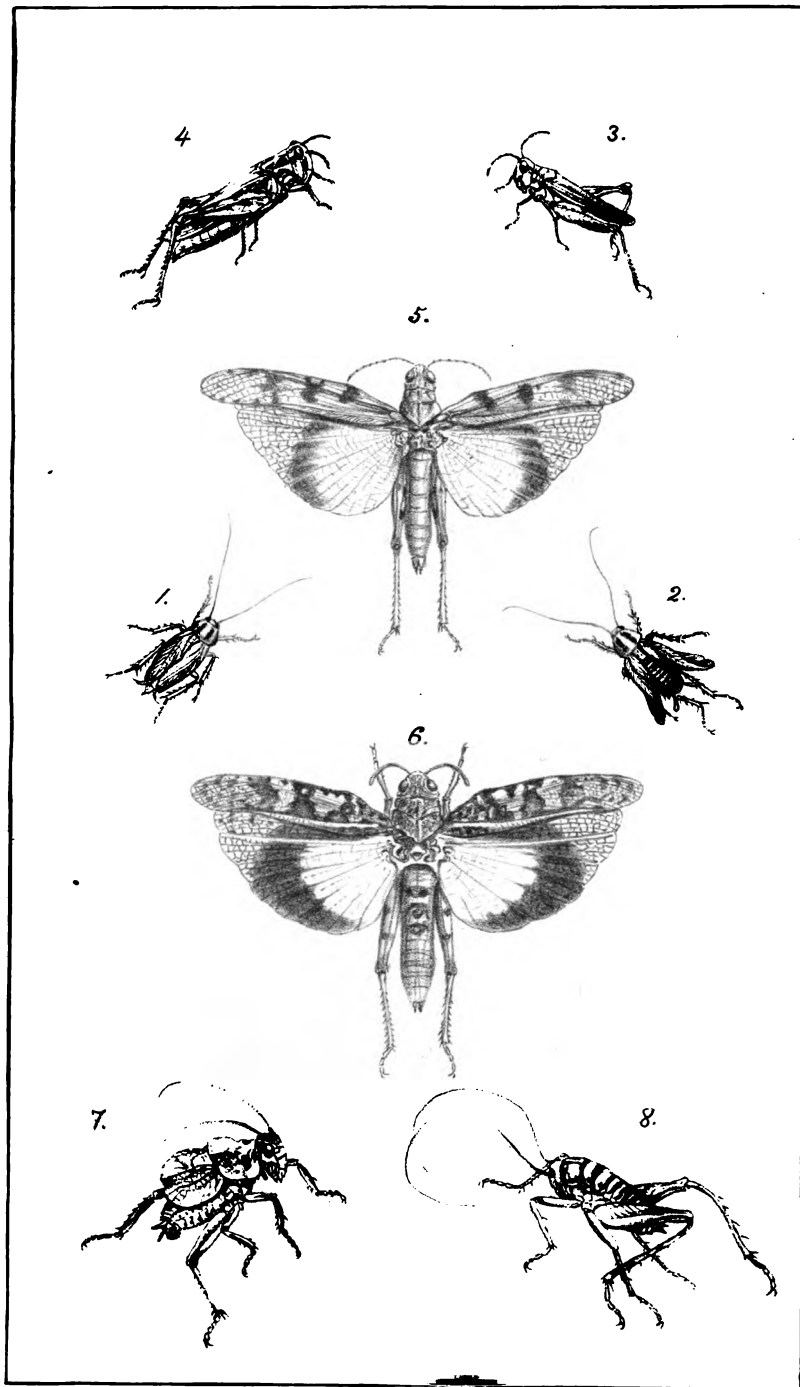


Copper Axe wrapped in Cloth
From Mound near Davenport, Iowa.



Stone Pipes
From Mound near Dayton, O.











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